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Journal of Electricity and Western Industry entered as second class matter February 17, 1921, at the post office at San Francisco, under the Act of Congress, March 3, 1879
Published the 1st and 15th of each month, at Rialto Building, San Francisco, California.

APR -8 1922

Journal of Electricity and Western Industry

A McGraw-Hill Publication

ROBERT SIBLEY, Editor — Founded 1887 — C. M. LINDSAY, Bus. Mgr.

VOLUME 48 — SAN FRANCISCO, APRIL 1, 1922 — NUMBER 7

A semi-monthly chronicle of western events, advocating the economy, efficiency and convenience of electric power for all industries of the West—manufacturing, agricultural, mining, merchandising, home building and home making. Interpreting the value of electrical development to the business and financial man, the industrial man, the power man, wholesaler and retailer, contractor and constructor, engineer and home owner.

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Member Audit Bureau of Circulation.

Printed in U. S. A.

The McGraw-Hill Company, Inc., of New York, parent company to McGraw-Hill Company of California, are also publishers of

Engineering News Record
American Machinist
Power
Chemical and Metallurgical Engineering
Coal Age
Engineering and Mining Journal-Press
Ingenieria Internacional
Bus Transportation
Electric Railway Journal
Electrical World
Electrical Merchandising
Journal of Electricity and Western Industry
(Published in San Francisco)
Electrical Review and Industrial Engineer
(Published in Chicago)
American Machinist—European Edition
(Published in London)
Pacific Mining News Supplement to Engineering and Mining Journal-Press
(Published in San Francisco)

EASTERN OFFICES:
NEW YORK, Tenth Ave. at 36th St.
WASHINGTON, D. C., 610-611 Colorado Bldg.
CHICAGO, 1570 Old Colony Building.
PHILADELPHIA, Real Estate Trust Building.
ST. LOUIS, 713 Star Building.
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PUBLISHED SEMI-MONTHLY BY

McGRAW-HILL COMPANY of CALIFORNIA, Rialto Building, San Francisco

James H. McGraw, *Chairman of Board* — Robert Sibley, *President* — H. A. Lewis, *Vice-President* — H. W. L. Gardiner, *Vice-President* — C. M. Lindsay, *Sec'y-Treas.*

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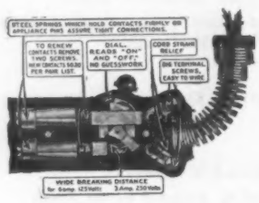

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A McGraw-Hill Publication

ROBERT SIBLEY, EDITOR

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Norman S. Gallison Clotilde Grunsky George C. Tenney

Vol. 48, No. 7 SAN FRANCISCO, APRIL 1, 1922 Per Copy, 25 Cents

The Most Important Problem of Western Industry

QUESTIONS of American valuation in the tariff, of the necessity of a sales tax or of the soldiers' bonus are all important to western industry—but in comparison with the problem of trans-Pacific relations, they are merely pleasant household controversies as against impending earthquake, flood and fire. Few people realize how serious the situation actually was at one time. California legislation and other western agitations, of course, had something to do with it—but there were questions of international relationships beyond this, based on the needs of an expanding population combined with the militaristic ideas of the right to a place in the sun.

Those who were in touch with the work of the disarmament conference at Washington felt with a great breath of relief that these dangers had at last been met—and through open dealing and reasonable forbearance had actually been removed, or at least, placed in the category of those things which fade away for lack of interest.

This editorial is written while the Four Power Pact, as it has come to be called, is still under fire. By the time the paper reaches our readers, the treaty may already have been ratified. For the sake of the future of the Pacific, which means as well the future of western America, it is to be hoped that the Senate will approve the judgment of the recent conference.

With all elements of progress bordering the Pacific working together, there is no limit to the possibilities of this great market place of the future.

Broadening the Cooperative Campaign Idea

INTROSPECTION is a great thing in these days of readjustment and the time has come to take account of stock. Editorial pages by the dozen in this magazine have been devoted in recent years to the good effects of cooperative movements throughout the West, particularly using as an instance the great success of the California Electrical Cooperative Campaign. This Campaign, as the pioneer of electrical cooperative leagues, has instituted traditions that are far-reaching and that undoubtedly have accomplished a tremendous amount of good in the upbuilding of the electrical industry, not only locally but throughout the nation as a whole. Get-together meetings, better accounting, better window displays, cooperative advertising, electrical home campaigns and many other things that go toward the upbuilding of the industry have been promulgated and advanced through the efforts of this movement.

These efforts are still of the greatest importance and the Campaign is today undoubtedly the most important single factor in advancing the electrical industry in California. But times are changing. We find that the modern channels of electrical trade are broadening. It is doubtful, for instance, if in California at this time the merchandising of electrical ware through the contractor-dealer is as much as 50 per cent of the entire movement of electrical merchandise. Similarly, as was pointed out in a recent editorial in these columns, the unconnected contractor who is without the pale of organized educational activity is today doing something like 75 per cent of the residence wiring in western cities. This means that contact with the public is very largely in the hands of men who are not receiving the benefits of cooperative educational movements, who are not concerned with telling the convenience outlet story, but who, on the other hand, are most anxious to sell any kind of material at any cost which will bring them the trade.

The contractor-dealer cannot deal with this problem alone. He cannot legally ask, nor would it be advisable if he could, that the manufacturer and wholesaler sell only to association members. He and the industry with him have tried the solution of making the association man a good merchant, on the theory that those outside the pale will soon annihilate themselves. This is good business sense, and undoubtedly has assisted in maintaining the importance of the contractor-dealer as a distributing channel, but the fact remains as indicated by the figures quoted above, that the principle of exclusion has failed.

There remains the possibility of taking these other agencies into the fold, impressing on them the principles of good business and leaving it to the processes of education to remove objectionable factors in competition. It is time to revitalize the cooperative movements of the electrical industry, to take

into consideration all those engaged in the merchandising of electrical ware, whether they be association contractor-dealers, non-association contractor-dealers, hardware men, druggists, department stores or central stations. Unless these cooperative campaigs can continue to grow with the problems of the electrical industry, meeting the need for education in electrical merchandising throughout all channels of distribution, they cannot hold their present high position of importance, nor will they deserve the tremendous influence and backing that they should receive under their broader conception of educational usefulness.

The Coordination of Storage Reservoir Facilities

WATER development on the Colorado River is a three-fold problem involving the storage of flood waters with the consequent prevention of disaster, the utilization of these storage waters for irrigation and the maximum development of power, consistent with both of these claims.

Not nearly so complicated is the problem of the proper coordination of storage reservoirs in the high mountains of the West on present day power systems with the storage reservoirs of some of our irrigation projects situated in the valleys below. Yet in this simpler relationship, the problem is still far from solution. More thought and study should be given to this coordination, notably in California. Here the irrigation projects are developing storage at low altitudes, many of them with power developments as an auxiliary function. The demand for water for irrigation is very seasonal, in some cases occurring in off-peak seasons and, in some instances, paralleling the heavy load demand of the power companies. The difficulty lies in the fact that with a large reservoir and a comparatively high dam with the plant located directly at the dam, as the water is drawn out the head decreases so rapidly that the power output toward the end of the season becomes low even though the draught of water is high. The result is a power plant which is but very little better than the ordinary stream flow and of very marked decreased value as an economic unit in the development of our power resources. It is to be hoped that all this discussion concerning the Colorado will lead engineers and executives concerned with the problem of the coordination of storage reservoirs to devote more time and study to the proper distribution of water duties with the best interests of the community in mind.

One Way to Retard Business Recovery

GOVERNMENT interference in the operation of an economic law does not hinder the operation of the law, it merely shifts the burden of the loss to someone else's shoulders, with the surprising results which are so familiar a phenomenon in a world of experimenting Congresses. With the business depression of the past two years, with the farmer suffering from low prices combined with the high cost of living and clamoring for relief, Congress has spent most of its time casting about for the proper law to enact which would remedy the situatio. In the meantime better crops, better prices and lower labor costs due to perfectly natural causes are fast remedying the difficulties.

It is admitted everywhere except in Washington that the continuance of high taxes is one of the primary obstacles to a revival of business activity. Congress, however, instead of devising ways of economizing in government expenditure, seems chiefly concerned with finding new sources of taxation for the purpose of doing something that does not need to be done and should not be done—namely, paying a bonus of cash to several million able-bodied young men who, in the course of fulfilling their duties of citizenship, spent time in uniform in the service of their country. The government is already spending $400,000,000 in compensation, hospitalization and rehabilitation for the benefit of soldiers who suffered injury or ill health in service, and no one would begrudge a cent of this expenditure even if it were twice as great. But to endow with cash the much larger number who suffered no ill effects from their army experience would confer a doubtful benefit upon the recipients, place a further burden upon taxpayers and retard the restoration of prosperous business conditions.

Locating an Industry in the West

DISTANCE between two points is best measured by the straight line. To those who are interested in the development of western communities, the straightest line between the eastern manufacturer and the establishment of a western branch lies in a straightforward telling of the business facts of the situation. Wm. H. Crawford, manager of the Department of Industries of the Portland Chamber of Commerce, in his article on another page of this issue points out the proper function of the community promoter in this field.

Western Chambers of Commerce on the whole have recognized their opportunities in this service and with some few exceptions and occasional lapses into superlatives, have undertaken businesslike studies of the needs and resources of their communities. Today they are ready with facts and analyses to assist the manufacturer by supplying figures he could not otherwise obtain.

In business the present era is one of cleaner competition because goods today are sold on their merits alone. Good advertising recognizes the weakness of the exclamation point and the high pitched voice and the value of conservative facts. If it be true that no manufacturer can afford to sell his product to a man who does not get his money's worth from it, this is even more true of a community. What the West needs is the proper zoning of its development so that each district is growing and contributing to western prosperity according to the natural factors of its location and resources. Chambers of Commerce and business organizations are the

ones to make the studies which will bring about this coordinated movement—and it is a good sign for the West that so many of them are recognizing the importance of this function.

The Rapid Rise of the Radio Telephone

A QUESTION of great interest to all power companies, and indeed to industrial plants of all kinds which have separate plants and factories situated in various parts of a district, is that of adequate communication between these districts, plants and substations. Private telephone systems are expensive, commercial systems are subject to failure in time of storms and do not always extend into mountainous or desert regions where they are most needed. Hence, it is true that all central station operators, and indeed leaders of other industries throughout the West are awaiting with great interest the development of a dependable, efficient and not over-expensive radio telephone equipment.

There seem to be two outstanding factors that for the time being are preventing the more general use of radio telephone equipment in installations of this nature. The first is that of the clarification of patent rights for commercial use, which is now being agitated, and the second is that of the proper allocation and proportion of wave lengths in radio application, with rigid enforcement and supervision. Secretary Hoover in his recent hearing in Washington, formulated a basic situation that should prevail in the allocation and proportion of wave lengths for radio service, namely, that this allocation and proportionment be based upon the commercial importance of the installation involved, with due regard to doing everything possible in the encouragement of the amateur and his investigations. Due to the fact that over-allocation has taken place in many of the districts of the West, it would be well for power company and industrial executives to take it upon themselves at this time to make application for wave length reserves for their particular needs. This should be done before the system becomes more complicated than it is at present, for the entire matter is one of great industrial importance. Not only is the radio telephone rendering vital service in such installations as that now in use by the Southern California Edison Company in its Big Creek development, where one of its trans-Sierra construction jobs is going on entirely through communication by radio, but the subject is also of increasing importance down in the valleys and in the more populous centers, particularly as a means for keeping communication intact in times of emergency.

Spending the Money Where It Will Help

ALMOST everyone has had something to say on the subject of the railroads—most of it rather monotonous. The railroads must reduce rates, the railroads must reduce rates again, the railroads must reduce rates. As a relief to this chorus, it is refreshing to hear the businesslike voice of Mr. Hoover, to whom the public is coming to look for sound economic thinking on problems of the day. Says Mr. Hoover:

> It seems to me vital that the railroads as our greatest industry should propose a courageous program of broad visioned betterments and if necessary the government should consider giving the use of its superior credit. . . . We talk glibly of giving billions of credits to foreign countries to increase our farm exports. I wish to say with all responsibility for the statement, that a billion dollars spent upon American railways will give more employment to our people, more advance to industry, more assistance to our farmers, than twice the sum expended outside the frontiers of the United States— and there will be greater security for the investor.

The West more than any other section of the country, is dependent upon the service of the railroads. Mileage of railroads in the western part of the United States has increased from 14,443 miles in 1870 to 141,138 miles in 1920, a far greater increase than any other district. Western growth has only been possible because of these continually growing outlets for western products. Water transportation is a help to coast districts, but even this would be of little value without the rail service to the tributary country back of each port.

The railroads have a self interest story which is very similar to that of the power companies. If the West is to grow and prosper it must have electric power—and it must have ever-increasing transportation facilities. If the railroads are to be able to furnish these facilities, they must be in a position to attract capital. The story is familiar and one which should appeal to all business men,—in particular to those engaged in the electrical industry.

The Common Sense Attitude Toward Earthquakes

BEFORE the advent of modern engineering methods in dam and levee building and the institution of the weather bureau, floods were an even more destructive agency in this country than they are today. The study and understanding of lightning protection has minimized the losses to power companies from mountain storms. And now come western scientists with the contention that earthquakes are a periodic phenomenon in the same sense, capable of prediction and worthy of study which shall enable protective measures to be taken which shall greatly lessen their destructive force.

This is the common sense attitude toward this class of catastrophe. Nothing but good can come of the complete mapping of fault lines throughout recent earthquake areas and the study of engineering and architectural provisions against failure in case of a fault slip. It is thought at the present time that the extremely delicate instruments worked out during the war for the detection of submarines may be used in deep wells where they may be placed in contact with substrata, to detect conditions of unusual stress which might indicate the imminence of an earth movement.

Whatever knowledge it is possible to gain on this subject is just so much safeguard against possible future damage.

Western Comment on Current Events

Editorial Notes and Readers' Views on the Outstanding Aspects of Financing, Trade Promotion, Legislative and Associated Topics that have a Special Bearing on Western Business

To Investigate Ontario Commission

Premier Drury Criticises High Costs of New Power Development by Hydro Electric Commission of Ontario

FROM the emphasis which is being placed upon California discussions of the government-owned power experiment in Ontario, one would think it only necessary to prove this Canadian system a success in order to establish the principle that similar systems should be inaugurated elsewhere in all other communities. As a matter of fact, of course, differences in power generation as well as of power demand make any such proposition a new problem to be solved on its own merits for each locality. If this experiment is not a success, however, its failure is an argument of great pertinency as indicating the faults of such a system under the most favorable of circumstances, with Niagara available as a central and economical source of power.

It is therefore of interest to learn that the recently elected government of the Province is not altogether in sympathy with the work of the Hydro Electric Commission. At a recent meeting called at the request of the business organizations of Toronto in order to ascertain the position of the government in regard to Hydro Commission plans, Premier E. C. Drury stated his disapproval of the lack of accuracy in estimates of future costs and the absence of information in regard to present expenditures and promised an investigation. He said in part:

> I do not know, nobody knows, whether the money is being well spent or not, but the people have a right to estimates that are fairly accurate on which to base their judgment before passing on the projects.
>
> In 1918 the engineers of the Hydro Electric Power Commission estimated that 275,000 horsepower could be delivered at Chippawa, Queenston and Niagara Falls for a total cost of $25,000,000, whereas the cost already has exceeded $65,000,000.
>
> Likewise, at Port Arthur and Fort William, in the western portion of the Province, the people were promised cheap power by the Hydro Electric Commission, which erected a water power plant at Nipigon. The estimated cost of the plant was $4,500,000. To date more than $6,000,000 has been expended and the plant is only partially completed.
>
> Power which was sold by a private company at from $15 to $17 a horsepower year is sold by the Commission to the public in Port Arthur and Fort William for $21 a horsepower year, and in addition the Commission is piling up a yearly deficit of $300,000.
>
> No business man would tolerate such estimates, which mount up without justification. Such a system is not a benefit, but a burden and that is why the Government is stepping in.
>
> The policy of the Ontario Government will be to see that the projects of the Commission throughout the Province are directed along sane, sound business lines for the benefit of the people.

A New Element in the Tariff Situation

So-called "Trading Clauses" Are of Greatest Importance to Western Manufacturer According to California Canner

OVER 66,000 tons of canned goods, not to mention a similar tonnage of fresh and dried fruit, were exported from the port of San Francisco in 1921. This is but one outlet of the several important shipping points on the coast—in fact, a very large proportion of western food products now find their markets in foreign fields. In consequence the western canner has been much concerned with the outcome of the present tariff legislation. He grants the need of high tariffs on citrus fruit and other competitive products in which domestic markets are threatened, but also points out the need for the development of foreign trade.

This is not to be brought about entirely through the lowering of the tariff barrier—it is fully as important to secure the reduction of inimical tariffs imposed by other countries which act to keep out western products. In Latin America, for instance, canned fruits are placed on the luxury list. In France, American canned fish products suffer under tariffs which are much higher than those imposed against the same product from other sources. Western canners are therefore particularly interested in the so-called traders' clauses which have been introduced into the tariff measure. These sections give the President the right and make it his duty to raise the duty in this country against foreign products if the countries of origin are assessing a higher rate of duty against "like or similar products" coming from this country. He is also given the power to reduce tariffs 20 per cent in consideration of like concessions received from any foreign country.

In this connection, Chas. H. Bentley, vice-president of the California Packing Corporation, says:

> During the past twenty years persistent efforts have been made in the industry through steamship companies, insurance companies, through banks, through commercial organizations, and through various agencies of our government to bring about a better understanding and better conditions, but these efforts have been without success. So the industry has been forced to the conclusion that our only way of dealing with the situation is to have some trading clauses in our tariff so that we can extend consideration to countries which deal considerably with us, and per contra we shall be in a position to protect ourselves against countries which, in our opinion, maintain unreasonable levels of tariffs against us.
>
> Accordingly, the National Canners' Association has encouraged the various branches of the canning industry to make suitable representations before the Ways and Means Committee at the hearings which began in January, 1921. These have been followed up from time to time by the supplementary briefs through the Finance Committee of the

Senate. Most of the branches of the canning industry have indicated very clearly to these Congressional committees that they are asking for protective tariffs, not so much because they want protection, but to establish a trading basis. In other words, we have to have some tools to work with, and if we are going to secure concessions from foreign countries, we have got to have something to give them in the shape of reduced tariffs in this country.

Important Savings in Mineral Industry

Western Office of Bureau of Mines Records Important Contributions to Western Oil and Metal Industry

THERE are two ways of increasing production—one to develop new resources and the other to stop the losses in the processes now under way. Of the two, the second may be said to be the most important in the present campaign for saving waste. Among the agencies which have rendered most effective service in bringing about savings of importance to western industry should be mentioned the United States Bureau of Mines which maintains offices throughout the West.

At the San Francisco station of the bureau, for instance, a special process has been devised for cracking heavy tars and oils which promises the recovery of large yields of gasoline and other lighter products, hitherto regarded as unrecoverable. There still remains some difficulty in the utilization of the pitch like residue which must be worked out before the process is commercially applied, but nevertheless the discovery is one of the utmost importance.

Important results in the utilization of the low grade and complex ores of copper, lead, silver and zinc, which constitutes a great problem in the mineral development of Colorado, Utah and the intermountain region, are promised by the utilization of a new chloride volatilization process recently worked out. The sulphur dioxide leaching of porphyry copper ores of Arizona holds the promise of important developments for the mineral industry of the Southwest.

The Question of the Hour in Oregon

Tax Revision and Acceptance or Rejection of a Proposed State Income Tax to be Main Issue in Coming Elections

THE burden of taxes national, state, county and municipal has caused a wave of public protest in many of the western states. Present indications are that in several states political campaigns will be fought along lines of reduction of public expenditures. In Oregon, for instance, it is estimated that during the last decade population has increased sixteen per cent and assessed valuations twenty-three per cent, while state tax levies have increased five hundred and twenty per cent. At present, tax reduction or tax adjustment is the question of the hour in that state. A state tax investigation committee is touring the state and has held many hearings on the subject of taxes. Judging from press reports, public sentiment has been thoroughly aroused and the outcome of the committee's investigation will be widely discussed.

A period of industrial distress and agricultural depression always arouses the sleeping elements of political discontent and radicalism. Oregon is not alone in her "hard times" nor in her burden of taxes, but she does seem to have more than her share of extremists who would cure the present ailments by the single tax, state socialism and such alleged remedies.

A proposed state income tax occupies the center of the stage at present. It is backed by the agricultural interests principally in eastern Oregon, who claim that farmers and stockmen need relief from the present tax system, which, they argue, now requires heavy taxes on a large investment that is showing a small return.

Can a state stop the constantly rising tide of taxation? In every western state there are pending demands which will draw even further upon the tax reservoir. What success will Oregon have in her attempts at revision and reduction? The West awaits the outcome with interest.

Low Rates in British Columbia City

Record of Rate Reductions an Important Feature of British Columbia Electric Railway Company's Annual Report

THE central station industry as a whole is proud of the record of small increases and subsequent rate reductions which it can show for the war and post war period. Few power companies, however, can better the figures brought forth by the British Columbia Electric Railway Co., Ltd., as part of their recently issued annual report. According to this record, only nine cities of over 50,000 population in the United States or Canada have lower lighting rates than Vancouver, B. C. This is the result of consistent rate reductions since the date of organization of the system. Even the war period, which was marked by increased rates in most districts, did not affect the steady lowering. Since the beginning of the company, these rates have been as follows:

Until 1900—18c. net; meter rent 25c.
1900-1901—16c. net; meter rent 25c.
1901-1904—16.15c. net; meter rent 20c.
1904-1906—12c. net; meter rent 20c.
1906-1909—10c. net; meter rent 15c.
1909-1918—8.8c. net; meter rent 15c.
1918-1919—8c. net; no meter rent. Minimum monthly charge 50c.
1919 and still in effect—6c. net; no meter rent. Minimum monthly charge 50c.

That the community has prospered under the company's service is indicated by population figures which show that the population of the city of Vancouver in the year of the company's incorporation, namely 1897, was 20,000. It had increased to 52,000 in 1906, 79,000 in 1909, 100,000 in 1911, and decreased to 96,000 in 1916. At the end of 1918 it had increased to 109,000, and the recent census gives Vancouver a population of 116,700.

At the present time the company has under way the construction of an additional unit at the Stave Lake plant which will bring in an additional 13,000 hp., as well as in contemplation the development of 80,000 additional horsepower which will be brought in as demand justifies.

Letters to the Editor

President of California Manufacturers' Assn. Discusses Industrial Problems

To the Editor:

Sir: The problems confronting industry today are most serious in their nature but are by no means insurmountable. The conditions against which we are now contending constitute a stern challenge to our powers of efficiency and of intelligent business administration. That we shall ultimately succeed in readjusting the various economic factors affecting our affairs there can be no question. The process will be favored or retarded, however, according as other elements in the community recognize their true obligations toward invested capital.

The individual must work in order to exist, but not so with capital, for the latter, consisting as it does entirely of savings of the people, may easily take refuge in the strong boxes or secret hiding places of its owners, where it may remain indefinitely secure against loss or deterioration. It seeks employment in business investment only when there is reasonable assurance of gain by so doing and at the slightest indication of danger it promptly retires from further participation in the financing of industry. Those influences which today most seriously threaten the security of invested capital are responsible for the greatest share of our industrial ills.

The present excessive burden of taxation operates greatly to the disadvantage of industry and of business in general, although it must be admitted in all frankness that much of this burden is the inevitable consequence of the debts of war, which debts must be accepted without serious question and legally discharged. Every avoidable tax, however, which is imposed for purposes not absolutely essential must operate to retard the final recovery of business to its normal status.

Unnecessary legislative interference with the conduct of business is also greatly to be deplored during the present period of industrial readjustment. With such a bewildering variety of economic problems demanding immediate solution, the business executive is entitled to at least temporary relief from the paternalistic efforts of various individuals and groups that are intent upon the correction of every known ailment of society through the attempted control by legislative enactment of the details of business. These measures are largely unintelligent in their conception, futile in their application and uneconomical in their results.

It is the constant aim of the California Manufacturers' Association to secure the widest possible recognition of these principles through every reasonable and proper means.

JOHN R. MILLAR,
California Manufacturers' Assn. President.

Willamette Falls Electric Company is Pioneer in Long Distance Transmission

To the Editor:

Sir: In the January 15th edition of the Journal of Electricity and Western Industry there appears on page 59 under the heading "World Records of the West—From 10,000 V. to 220,000 V.," a picture showing one of the original plants and a statement as follows:

"Previous to the erection of the Pomona line in 1891, sending 11,000 volts a distance of 20 miles, it was thought that electricity could be used only within a small radius of the spot where it was generated. This California experiment ranks as the first record."

I think you are correct in your statement that the California experiment ranks as the first record where 10,000 volts were used for transmission. It may be of interest to you, however, to know that in 1889, on June 3rd, electric energy was transmitted for the first time from the falls of the Willamette River, Oregon City, Oregon, to Portland, a distance of approximately thirteen miles. On June 4, 1889, in the column of the "Oregonian" entitled "Portland and Vicinity," there appeared a side head article entitled "Worked Like a Charm." This article reads as follows:

"The Willamette Falls Electric Company started up one of their Brush arc dynamos last evening, and the electricity was sent from Oregon City for lighting one of their 10:00 o'clock circuits in this city. It worked magnificently and conclusively demonstrated the fact that our city can be lighted succesfully from the falls. The result was a pleasing surprise to the company, the percentage of loss of electricity by transmission being much less than their most sanguine expectations. The work of removing the machinery from the station here to the falls will be carried on as expeditiously as possible. Another large dynamo will be moved up today."

The Willamette Falls Electric Company is one of the predecessors of the Portland Railway, Light and Power Company. At the time the station in question was started, arc circuits were the first circuits to be put into commission. Prior to the starting of the hydraulic station at the falls, the company had been operating a steam driven plant at Weidler's saw mill in the northern end of Portland and had installed there some 1,000-v. Westinghouse alternators and various arc machinery, etc. For operating in the new hydraulic plant at Oregon City, some 4,000-v. Westinghouse alternators were purchased and for a number of years they formed the principal apparatus from which the City of Portland was lighted. Such apparatus as was removed from Portland to Oregon City was taken up gradually and the full load was not placed on the water power plant until the latter part of 1889.

Mr. George P. Lowe, who was editor of the first San Francisco electrical publication which, if I am not mistaken, was the predecessor of the "Journal," lived in Portland at the time this plant went into commission and during the 1905 Exposition he was very much interested in gathering together data pertaining to this early plant.

My object in sending on to you this information is merely to indicate that even ahead of the time when 10,000 volts were used to transmit a distance of 20 miles, 4,000 volts were being used to transmit a distance of 13 miles to the substation in Portland and thence, by way of circuits, throughout the City of Portland, so that I have no doubt but that we may have approximated 20 miles with some of our circuits, although at the lower voltage.

O. B. CALDWELL,
Portland Railway Light and Power Co. Vice-President.

N. E. L. A. Executive Says Electrical Industry Should Lead in Bettering Business

To the Editor:

Sir: The fundamental idea that the electrical industry should take the lead in striving for Bigger and Better Business, and for not only insuring a return to normal business, but to a scale of business better than usual, seems to be taking hold all over the country. We have already received numerous requests for specific information as to the plan, and the promises of many of our most important executives that they will get behind the plan are being received from every direction.

I am glad to know that the Pacific Coast has taken hold of this matter so enthusiastically and I believe you are better

organized to conduct this work on the Coast than anywhere else in the country.

I believe that we can get every interest identified with any branch of the electrical industry to work in harmony on one specific general plan to promote the introduction and general use of electricity in all its branches. We are certain that public utilities can secure money today and have a better assured outlook for securing new money than ever before in their history and we believe that by our united efforts we can place our commercial development activities on a higher plane than we have dreamed of heretofore.

The success of the movement in any particular locality will depend very largely upon the enthusiastic support of the public utilities in that locality. We hope and believe that before our convention in May we will be able to report the adoption of this movement by substantially every important public utility company in the country. We then propose to use the convention as a vehicle for securing nation-wide publicity for the movement and to make the commercial program the most active part of our national convention.

For the last five years we have not been able to continue our commercial developments and many of our companies have either disbanded or partially disbanded their sales departments. The time has come when commercial work should be reorganized on a broader scale than ever before.

The Journal of Electricity and Western Industry has it in its power to do more on the Pacific Coast than any other medium because it reaches not only the executives but the rank and file of our member companies, who must also become enthusiastic and work whole-heartedly in support of the movement, and we are counting upon it strongly to use its columns freely and believe that Bigger and Better Business will have a directly beneficial effect upon its business success.

MILAN R. BUMP,
National Electric Light Association. President.

Declares That Shippers of Green Tree-Fruits in General Lost Money in 1921

To the Editor:

Sir: In your issue of March 1st, 1922, is an editorial which I can hardly agree with. This editorial is under the caption "Lower Freight Rates in the Green Fruit Industry." Paragraph four commences, "Generally speaking, the public is not by any means convinced that the green fruit producers have been hard hit by increased rates."

I will stake my reputation as a grower and shipper that fully one-half if not three-fourths of the deciduous tree-fruit eastern shipments of last season (not including apples) represented a loss to either the grower or shipper or both. In a general way the public heard of a few good sales but did not hear of the hundreds of cars that brought red ink.

Also in an article in the same issue the statement is made that "flourishing conditions apply to horticulture in general, except apples." He should have included nearly all kinds of deciduous tree-fruits with apples or below them.

I recall hearing a large tree-fruit grower, who is also a regent of the State University, state that when you started fifty cars of deciduous tree-fruit last season you kissed profits good-by. Mr. Stone's article in this issue is a very fair, logical statement. He is talking facts when he says "an illustration can be offered in the precarious situation of the California green fruit industry," meaning tree-fruit.

As long as we have this kind of prohibition, grapes are O. K. Apples are helped a little, but other tree-fruits not at all. With a light crop of eastern fruit and good times we might get by, but change either one and we face a loss.

GEO. W. ASHLEY, Director.
California Growers & Shippers' Protective League.

Radio Bulletins

Business in San Diego is generally profiting from projects which have been undertaken there by the government. A million dollar naval hospital is nearing completion, two dredges are operating constantly in the harbor and the city will soon be one of the principal operating bases of the Pacific Fleet.

The Denver Civic and Commercial Association has adopted a slogan, "500,000 in 1930," and has raised a preliminary fund of $15,000 to advertise the industrial and agricultural districts of the state adjoining the city.

Secretary of Commerce Herbert C. Hoover is visiting the Pacific Coast in conjunction with the hearings of the Colorado River Commission which are being conducted in the various states which are interested in the development of this river. Meetings have already been held in Phoenix and Los Angeles and others are scheduled for Salt Lake City and Denver. Secretary Hoover is chairman of the Commission.

The eleven million dollars which the Southern California Edison Company received from the city of Los Angeles for the company's distribution system, will be spent on the hydro-electric development program which the Edison company has outlined for this year.

Word from Spokane, Washington, indicates that practically every large lumber mill in eastern Washington and northern Idaho will be in operation within thirty days. Weather conditions are holding up operations. Logs are imbedded in the ice in the mill ponds and the snow is yet too deep in many districts.

The Journal of Electricity and Western Industry has arranged for the broadcasting of news from station 7XF in Portland. The news, which is prepared by W. C. Heston, northwest editorial representative for this publication, is sent out every Monday night at 7:30 o'clock on a wave length of 360 meters.

The Spirit Lake Railway and Power Company of Vancouver, Washington, has been organized and has applied for permits to develop 35,000 horsepower on the Toutle river in northern Washington.

Imports and exports from the Port of Seattle showed a gain of 40 per cent during the month of January, amounting to $36,560,000. Imports increased approximately four hundred per cent over the corresponding month of the preceding year.

Numerous freight rates asked by the lumber interests of the Northwest, will soon go into effect as the result of favorable action taken at a recent meeting of railway traffic officers. The rates are materially lower than these in effect at the present time. They will apply to all points east of the Mississippi River.

Lumber and wheat hold the center of the stage in the Pacific Northwest. Better prices following increased buying has practically cleaned up the wheat while shipments of lumber are increasing daily. It is estimated that 60,000 men are employed in the Oregon and Washington lumber mills at the present time. This number is being increased continuously. Bank clearings in the Pacific Northwest cities show decided improvement, those of Seattle having increased 25 per cent during the past week, over the same week in March, 1921.

The canning industry in California is facing a prosperous year, according to all reports. The 1921 pack is reported as completely sold at prices higher than expected. The asparagus pack for 1922 has been entirely taken upon futures with many jobbers still clamoring for a share of the pack. Orders were far in excess of the estimated pack. The announcement that the Van Camp interests had negotiated for four canneries in central California has caused some stir. This company announces that it will enter the fruit canning field during the fruit season and will operate its plants during the remainder of the year on other well known non-seasonal Van Camp products.

In the Intermountain District, people are still conjecturing on the opening of the Utah copper mines. The Montana mines have been working on a small scale for more than a month and preparations are rapidly being made to increase the output. Increased building operations are predicted for both Salt Lake City and Denver with the arrival of spring.

Builders of the West

EDWARD F. ADAMS, who has been for twenty-five years one of the leaders of economic and financial thought in the West, as an editorial writer, author and civic leader is truly a builder of the West. In dedicating this issue we have decided to depart from the usual style in which this department has been conducted and quote from an autobiographical sketch which Mr. Adams has furnished us, at our request.

EDWARD F. ADAMS

Editorial writer for the San Francisco Chronicle, who, as an author and founder of the Commonwealth Club, has been a leader and builder of western ideals and ideas.

"I was born into the family of a New England clergyman during the period when to enter such an environment was a very serious business. That was quite a number of years ago. While still a child my father removed to the Western Reserve in Ohio which at that time was a miniature New England. As I grew older I came to be known in the community as 'the preacher's devil.' As I do not remember that I was disliked I suppose the delinquencies which brought me that title were such as the gentler ecclesiasticism of these days would call only "venial sins." It is highly probable, however, that I was suspected of playing cards and they may have had the goods on me. In that community at that time any lad who did not give outward and visible evidence of early piety—as I regret to say few of us did—was likely to be in ill repute. At any rate if there was mischief done and not accounted for the burden of proof was on me to show that I did not do it. After an excellent academic and partial college course I began life as a dirt farmer at the age of 20 years. In the second year of the Civil War I enlisted in an Ohio regiment as a private, but was later discharged from a general hospital as unfit for service, and not likely to become so. Never before entering the army, during my period of service, or since did I ever fire off a gun. While in the army I drew down $13 a month and paid $30 a month to a hired man to take my place as a dirt farmer. None of us were called heroes or got any bonus for many a long year after. And we should not have received it then if the more enterprising among us had not stirred us up to make a fuss about it. In those days it was called 'doing politics for the soldier votes.'

"Later I tried to get into the Mississippi Navy as some kind of an officer and though I had an excellent pull, and used it, the doctors would not take me. All of my officer friends who tried to get me in and the scrupulous doctors who kept me out are dead and gone years ago and I, in excellent health, am writing this story. You never can tell. I came to California in 1878, spending the first year as dirt farmer on the Mendocino coast. The next year I accepted a position—meaning got a job—as western agent and lobbyist for a New York publishing house, which I followed until about 1892 when I reformed and became a nice man. In succession after my reform I was dirt farmer, for three years an officer of Cooperative Farmers' Organizations, as we knew them in the nineties and finally in 1898 I completed my reformation by entering the 'brains' department of the journal which I have served since, thereby finally becoming, as I trust, a truly good man. During the period I have helped start several things, some of which stuck. Among them, in addition to farmers' organizations, I started a summer school of economics and husbandry on my farm in which professors of Stanford and the State University conducted services a month each year for three years. When I left the farm it busted. I served the University of California for several months as conductor of Farmers' Institutes which I had previously worked up. That was long before the College of Agriculture attained to its present glory and when it really needed a friend. For nearly 20 years I was president, or active director, of one of our benevolent societies. I was one of the founders of the Commonwealth Club of which I have been an officer from the date of its organization to the present time. During the last quarter of a century I have published two or three books, which would have greatly benefited mankind if by any possibility mankind could have been induced to read them."

When the Buyer of Location Meets the Seller of Opportunity

A Discussion of the Factors Underlying the Establishment of an Industrial Plant on the Pacific Coast and the Obligations of the Chamber of Commerce or Other Merchandiser of Community Advantages

By WILLIAM H. CRAWFORD

IN every walk of life, we find the relationship of buyer and seller. As a matter of fact, the buying and selling, the exchanging of ideas, of service, of commodities, and of opportunities, is just about the complete measure of human activity.

Eastern industry looms large on the business horizon today as the buyer of location,—the Pacific Coast as the seller of opportunity, and a very difficult problem presents itself, however, from the standpoint of both buyer and seller.

An eastern industry seeking a location usually has a lot to learn in a very limited time about that great empire lying west of the Rocky Mountains, bounded by Canada on the north, by Mexico on the south and by the Pacific Ocean on the west. Pacific Coast communities have the unsolved problem of seeking out legitimate prospects. Every Chamber of Commerce from Vancouver to San Diego has a long list of concerns wanting something for nothing or needing financial assistance. These industries are continually seeking out the seller. But the well financed eastern industries who do not want free land, bonuses or financial help must be sought out, and they must be sold on the basis of real facts that cannot be established except by a complete industrial survey.

The matter of financing is really one that should be taken care of by the proprietors of industry. The problem of the selling agency is to establish good and sufficient reasons why certain industries would prosper at certain points, and to assist in disclosing every obstacle that would prevent success. Empty buildings and smokeless stacks are no credit to a community. The far-sighted chamber of commerce will work as hard to prevent over-expansion of industry as to encourage additions to a community where the conditions warrant legitimate expansion.

Aggressive selling, applied to setting forth the various advantages of different localities has grown to be a business in itself, usually conducted by a chamber of commerce or commercial club. At the same time, every business organization, every banking institution, every newspaper, every magazine, every railroad system, and almost every individual in a community has some part in selling that community.

Since we have likened eastern industry to the buyer, and the Pacific Coast to the seller, we should step outside of the problem long enough to view it well from the standpoint of each.

The Point of View of the Buyer

Consider the buyer, for example, who is not particularly anxious to be sold. Perhaps he has been driven to consider the Pacific Coast because competitors were establishing themselves west of the Rocky Mountains. Perhaps his attention has been called to the fact that one of the Pacific Coast ports is closer to Manila by 3,515 miles than is the Pacific entrance of the Panama Canal. That by adding 1,402 miles from Panama to New Orleans, he may save a total of 4,917 miles, the equivalent of a trans-Pacific volage, in landing the raw materials of the Orient on the Pacific Coast of the United States for manufacture instead of landing them at a point like New Orleans or farther east. Perhaps, having journeyed west on a vacation trip, or to attend a convention, the buyer is greatly impressed with the Coast country which is building cities astounding to the easterner, and supporting unusual enterprises, reflecting great potential wealth of resource and the character of its people. In any event, we will suppose that the average eastern executive has acquired a wholesome regard for the future of the Pacific "whose shores and islands and vast regions beyond will become the chief theatre of human activities and events in the world's great hereafter."

We are told, time and again, that the files of many eastern industrial plants are filled with applications from the employes for transfer to the Pacific Coast in the event that employer opens a western branch house or factory. There is undoubtedly a westward urge, based on personal desire as well as business opportunity, but the prospective locator has a lot of territory to cover when he tries to make a quick survey of Oregon, Washington, California, Montana, Utah, Idaho, Nevada, and Arizona, comprising 25 per cent of the area of the United States.

If the preliminary trip to the coast has included a run around the circle, from San Diego to Vancouver, or in the opposite direction, the eastern visitor will be impressed with the magnificent distances and the size of the undeveloped areas. First impressions are usually lasting and have considerable bearing on subsequent actions. The unfortunate thing about first impressions on the Pacific Coast is that they may be gained at any one of a number of places along an ocean frontage of 1,670 miles.

When the prospect begins to study population figures, he will realize that a lot of territory must be covered on the Pacific Coast to reach as many people as are sometimes found within the limits of one large eastern city. This means expensive distribution and may cause some apprehensive thoughts. The buyer will hesitate somewhat at this stage of the proceedings but it will not be long until he falls into the hands of a booster (the Pacific Coast is populated with boosters) who will quickly re-establish a temporary peace of mind.

The thoughtful eastern prospect, however, soon decides that he has a big contract on his hands in

selecting a plant location for the Pacific Coast, or in deciding for or against any move at all. He usually returns to the East and lets the matter drop for the time being, or assigns one of his sales engineers to the job of coming back to the Coast and making the necessary detailed survey. This second visitor usually spends a few weeks in traveling over the area, in collecting authoritative information from every available source, in listening to the sales talks and in getting a composite picture of the Pacific Coast that will enable him to report back to his principals. And this is no small task because of the territory involved and of the factors of uncertainty in a rapidly developing, virgin country.

Some decisions that have been made in the past, have been too hasty and have led to over-development at one point with under-development at another. After the decision for a factory location is made, the executives placed in charge, during the next two or three years following the first operation of plant, may find by actual contact with the territory, some place or places that would have been better locations for the industry in question. If a wrong decision has been made, part of the responsibility rests with the seller.

Consider then the seller. With possible over-enthusiasm and with the advantage of a psychological moment in his favor, he may have assisted in bringing about a decision that is not altogether wise. On the other hand, a community salesman from some other point with lack of information or lack of opportunity, may have failed to have effected contact with the buyer, or if effecting contact, may have failed to impress him sufficiently.

The business factors, which determine the location of an industrial plant should be known to every community selling organization and only the highest exponents of the selling art should be employed. A community salesman must at least be one who can write a business letter containing something more than that old musty paragraph "trusting that you will not hesitate to call upon us if there is any further information you require,"—having the effect of a smoke screen, concealing real lack of ability.

Assuming first, that through some form of advertising or publicity, a connection has been established with legitimate prospects, the merchandising of community advantages must then be thoroughly organized. The selling agency must visualize that great economic unit of the Pacific Coast with its four great subdivisions now in process of formation, each with its own particular excuse for existence: the Puget Sound District, the Columbia River Gateway country, San Francisco Bay and Southern California —with nothing but youth against any of them.

With this background, the scattered population must be carefully studied in order to draw the proper conclusions regarding trade territory and Pacific Coast distribution. A nationally operated concern will probably take up the matter of Pacific Coast distribution only after disposing of the problems of national and international distribution. These involve a study of ocean transportation and rail connections.

The total population on the Pacific Coast today (less than eight million people) is so divided that there is a northwestern trade territory and a southwestern trade territory, separated by a zone of relatively insignificant population density. The mileage between these two trade districts is such that two plants would ordinarily be necessitated. The maximum consumption of the total Coast population, however, will sometimes not pay the overhead on two manufacturing or distributing plants. One location must therefore be selected that will combine to the best advantage, Pacific Coast distribution with national and international distribution, as well as with any purely local markets.

Making clear this problem to the eastern investor is a real service on the part of the community salesman of the Pacific Coast. It involves a study of conditions which the engineer sent out for a brief period can hardly be expected to prosecute. The seller can render a priceless service to the eastern investor by working with him on this problem of location with respect to present and future distribution in all its aspects or in guiding him through the maze of detail that involves, first, the selection of the particular city in which to locate, and then the particular spot within that city where operation expenses will be lowest.

The question of property is often raised before the city has been selected. This is certainly putting the cart before the horse. Free land at one point might be more expensive than $20,000-per-acre land at another. The city or district must be selected first, through a logical and orderly process and then the same general rules must be applied to the selection of the property within that district.

The supply of capital, it has already been pointed out, should be taken care of by the proprietors of industry in the usual way. The supply of raw material, including power and fuel, is a factor that varies with each enterprise and is really easy to analyze. Transportation will have been disposed of in any complete distribution study. The factor of labor is important to the final decision and conditions will be found to vary greatly in the different localities, though generally speaking, the entire Pacific Coast has the advantage of contented labor. It has been truthfully said that where living conditions are good, labor is efficient. Lack of sustained extremes of heat or cold throughout a greater portion of the Pacific Coast territory has a stimulating effect on living conditions, both winter and summer.

The truth about the Pacific Coast is good enough for anybody. So-called attractions of free sites, bonuses and other inducements to bribe locators is not sound merchandising. Furthermore, it is not a necessary expedient by which to influence a desirable industrial institution to locate where it really belongs!

With characteristic western spirit the unified selling efforts of the Pacific Coast are extended most helpfully to Eastern Industry and to Eastern Investors who see their opportunity in the golden Empire that was saved until the last; because it is the best.

Costs of Electric Energy in California Compared with Ontario

Public Utilities in California are Making Energy Available to Their Consumers at a Cost Far Less Than in Ontario when Differences in Taxes and Physical Difficulties are Taken Into Consideration

By ROBERT SIBLEY
Editor, Journal of Electricity and Western Industry

IN comparing the cost of electric power to the people of California and to that portion of Canada receiving power from the Hydro Electric Power Commission it is important to remember that Niagara Falls, combining its continuous flow of water with its large volume, should make the production of continuous power the cheapest for any part of the American continent. Yet the privately owned and publicly regulated electric utilities in California are making energy available to their customers at costs comparable with those paid for energy in Ontario, notwithstanding the physical difficulties inherent in the development of water power in California.

THIS article is the second of a series of three based upon a personal investigation by Mr. Sibley of the operations of government development of hydroelectric power in the Province of Ontario. The following article will deal with a statistical contrast of the growth of California and Ontario.

In this connection it would seem especially important to establish the facts pertaining to the distribution of energy to agricultural territory in California and Ontario. In the speech of the personal representative of Sir Adam Beck at the Riverside meeting of the League of the Southwest last December, we find the following statement:

> "We are supplying power to practically all the cities and towns in our Province, all of the larger villages, and most of the small ones, and have already constructed over 500 miles of pole lines to supply rural customers in various parts of the province, and, so great has been the demand for power in rural districts, that at the last session of our Provincial Legislature, an amendment to the Power Commission Act was passed, whereby, for the purpose of power supply, the Commission is authorized to divide the Province up into districts, known as 'Rural Power Districts,' the boundaries of these districts being fixed arbitrarily, according to the distance power can be supplied economically from existing power centers, or from lines or power centers that might be established for this purpose."

The speaker neglected to state that this action on the part of the Ontario Legislature of 1921 had been brought about due to the findings of a legislative committee appointed by the Legislative Assembly of Ontario to advise concerning a more equitable system of distribution of hydroelectric power and a more uniform price, wherein the Legislative Committee had the following comment to make: "The amount of power being used by the Hydro Electric Power Commission on the various systems in the Province is 337,170 hp., and of this only 2,500 hp. or less than one per cent is supplied to the agricultural industry." When we compare this situation to the 12,000 farms of California that today have the most wonderful service in the world with a connected load of over a half-million horsepower, which is 13 per cent of the entire connected load, we see how fortunate the agricultural communities of California have been in having the service not of 500 but of 15,000 miles of rural lines.

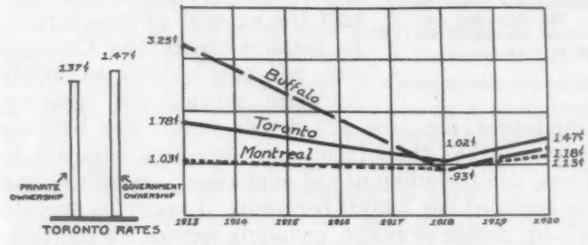
Comparison of Rural Power Costs

To go into further detail, it will be interesting to compare the cost of electric energy to California farmers as compared to the proposed cost in Ontario, even though the government of Ontario itself proposes to meet one-half the expense of this service. In small hamlets the Commission will now be able to supply domestic service for lighting, appliances, etc., for $23.00 per year. For lighting homes, other than farms, on highways adjacent to lines, and including use of appliances, the service can be supplied for $39.00 per year. Energy to operate a 3-hp. motor or range, including service for lighting, irons and toasters, can be supplied to a farm house for $86.00 per year, while a 10-hp. motor, including lighting and appliances, can be supplied on a farm for $220.00 per year.

Note what is already being done in California where, it must be repeated, the use of electricity on the farm is unsurpassed. In small towns on one of the great power systems of California the average bill for lighting and ordinary appliance use does not exceed $20.00 per year. For the same class of service on rural lines the average bill will not exceed $24.00 per year. A 3-hp. motor or range, including service for lighting, irons and toasters, can receive service from a typical power system for approximately $50.00 per year, the minimum charge amounting to $38.00 per year. Service can be supplied from this same system for a 10-hp. motor, including lighting and appliance use, for approximately $120.00 per year, the minimum guaranteed being not less than $90.00 per year.

It is difficult to get an equitable comparative statement of cost of service to agriculture, industry and home, since the physical situation in Ontario and in California is entirely different. The major portion of power in the Ontario system is derived from Niagara Falls and transmitted over level country comparatively short distances. In California, on the other hand, the plants are located in the high mountains, often hundreds of miles from the market for the power, necessitating the construction of many storage dams and power houses and long transmission lines over extremely rugged country. Furthermore, the water supply in California is not continuous, and it is necessary to supplement the water by steam power. Then, again, taxes in the state of California are in a large measure raised from her public utilities, while in Ontario the taxes paid by the Hydro Commission are insignificant in comparison.

I think it may fairly be stated that the building of giant dams for storage reservoirs and the maintaining of steam standby service in California, due to fluctuating stream flow in the mountains, necessitates an extra installation expense of from 15 to 20 per cent over the installation expense in the Province of Ontario. And, again, the extra cost involved in the construction of long distance transmission lines over hazardous mountain passes, and the extra energy losses in long distance transmission in California, in comparison with the average short line transmission losses involved in the Province of Ontario, with its comparatively level country, should reasonably involve an additional 10 to 15 per cent cost for service in California over and above the



COMPARATIVE CITY RATES, ONTARIO AND ELSEWHERE

The only Ontario figures which are given in a form possible of comparison are the city rates. These show that at the present time, both Buffalo across the border and Montreal, the leading city in the adjacent province of Quebec, enjoy lower rates under privately owned companies, than does Toronto under the Commission. In Toronto itself, the rates of the privately owned company in competition with the Hydro Electric Commission are the lower of the two.

costs involved in the hydroelectric development in the Province of Ontario. In addition, the state and federal taxes paid by California utilities is between 7½ and 11 per cent of their gross income and exceeded five million dollars in 1920. In the Province of Ontario only a small fraction of this amount is involved, amounting to less than $115,000 in 1920. In any just comparison of cost of electric service in California, as compared with rates charged in the Province of Ontario, it would seem obvious that California costs of hydroelectric development per horsepower should exceed those of the Province of Ontario by from 30 to 40 per cent, and consequently charges for service might reasonably be expected to be proportionately high.

Most of the available power sites in California are scattered along almost inaccessible mountain streams with comparatively small amounts of power available at each site. A comparison of the average California development of around 20,000 hp. with the single development of 500,000 hp. of the Chippawa plant of the Hydro Electric Power Commission clearly indicates how unit hydroelectric costs per horsepower in California should at times exceed those at Niagara, from 100 to 200 per cent, depending upon the conditions surrounding the development. The maintenance of a necessary steam auxiliary service is a handicap which may double the operating costs in California compared with the continuous water supply of Niagara.

A mere comparison of a few rates for power service in the Province of Ontario with a few instances in California does not in any way conclusively prove the advantage of one over the other. Partisans defending either side of the issue often seek to convince the listener by this method which is extremely dangerous and misleading.

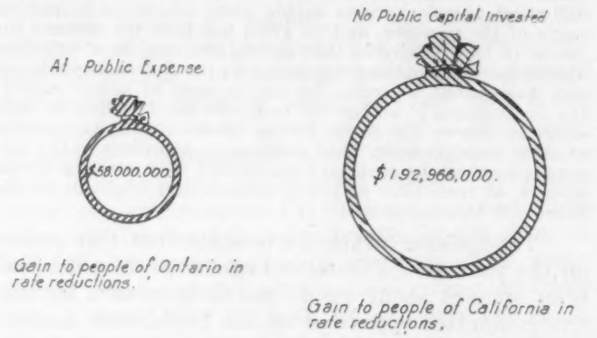
The Only Correct Basis of Comparison

No individual comparison of rates can be made between California and Ontario since the rate-making methods employed in Ontario have resulted in a widely varying cost of power, placing at a disadvantage those municipalities which are not near the source of power or near the main lines of the systems. In California it is the aim to equalize costs and not penalize the more distant consumers by pyramiding the cost to them simply because of distance from source of supply.

While both in California and in Ontario power is sold to consumers at cost, in California "at cost" include taxes, and a fair return on the investment. In Ontario, taxes are eliminated on electric utility property, excepting land. While the relief from the payment of taxes permits the government electric utilities in Ontario to reduce their costs for power by a corresponding amount, this only results in a transfer of the costs from the power consumer to the taxpayer, whether or not the taxpayer is a power consumer.

Despite all these conditions making for cheaper power in Ontario the fact remains that the power rate in California averages equal to or below that of Ontario.

The only fair and economic method of comparison is to take the sum total of electrical energy delivered to California consumers and divide this total into the total money received for this service,


No Public Capital Invested
At Public Expense
$58,000,000
$192,966,000.
Gain to people of Ontario in rate reductions.
Gain to people of California in rate reductions.

THE SAVINGS TO CONSUMERS IN RATE REDUCTIONS

Dividends to the people, according to advocates of the Ontario Commission, may fairly be reckoned in terms of money saved over a given period through rate reductions—and they point to the 58 millions which were saved to the people of Ontario in ten years' time. In California under private companies publicly regulated, the saving amounted to $192,966,000, or something like three and one-half times the Ontario amount. This further is without any investment or risk to public funds.

and thus get the actual selling price for electrical energy per unit of energy sold. Next, compare this basic unit with a unit charge for service similarly computed from the Ontario method of development, after allowing for the differences in development hazards experienced in one district and not experienced in the other, and a proper allowance for the light payment of taxes in the one community and the heavy payment of taxes in the other.

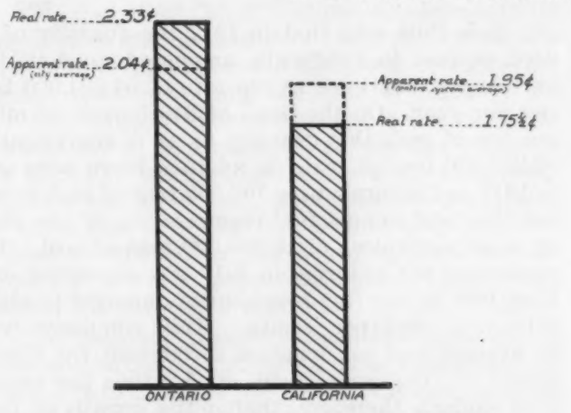
In a recent letter from the chief engineer of the Hydro Electric Power Commission of Ontario, I am advised that these general figures are not available for Ontario. In other words, the Commission has never gathered this important statistical data. A careful study of available data, assuming a load factor similar to that prevailing in adjacent territory, both in the United States and Canada, however, reveals the fact that the average charge to consumer on the Ontario system is 2.04c. per kilowatt-hour, delivered to the city distribution mains. If the same methods of accounting were used by the Hydro Electric Power Commission as are prescribed by the California Railroad Commission, this figure would read 2.33c. Assuming a 25 per cent loss in the city distribution system the average city rate in Ontario to the ultimate consumer is three cents, or over, which is the same general average that prevails in California cities. In California, on the other hand, the average charge to consumer of all energy sold is 1.95c. per kilowatt-hour, or, deducting the amount paid in taxes (which is not represented in the Ontario rate), 1.75½c. per kilowatt-hour. The California rate quoted above was obtained from 1921 figures and would be even lower during normal times when industrial demands with their low rates would further reduce the average rate.

The average rate which is quoted above for California of 1.95 cents per kw-hr. is computed from the following records of the California State Railroad Commission. Although there are approximately forty companies supplying electric service in California, these companies produce eighty per cent of the power sold in California.

STATE RAILROAD COMMISSION RECORDS

Calendar Year 1921

	Kw-hr. Sales	Revenue
Pacific Gas and Electric Company	1,021,820,689	$22,898,046.92
Great Western Power Company	340,060,361	5,947,710.73
San Joaquin Light & Power Corporation	313,791,835	5,084,780.88
Southern California Edison Company	840,081,210	15,074,480.00
Total,	2,515,754,095	$49,005,018.53



COST OF POWER TO THE ULTIMATE CONSUMER

The average cost of power to the ultimate consumer in the cities of Ontario per kw-hr. delivered to the city distribution system, is 2.04 cents. Were accounting methods in the figuring of depreciation and like items for the Province of Ontario made to conform to those in effect in California under commission regulation, this figure should read 2.33 cents for purposes of comparison. Assuming the customary distribution losses of 25% in delivering this energy to the consumer, this average charge becomes about three cents, which is about the same average rate that prevails in the cities of California. On the other hand, taking into account the entire sale of power from four large companies of California who deliver eighty per cent of the entire electric energy of California, we find the average rate to the ultimate consumer is 1.95 cents per kw-hr. or, deducting the tax to place it on a comparable basis with the tax free sales of Ontario, just about 1.75 cents per kw-hr.

Regarding Mythical Savings

Rate comparisons made under any other basis than that of general averages in costs to the ultimate consumer after taking into consideration all the varying factors involved are deceptive. This same fallacy in reasoning can creep into the discussion in instances other than rates charged. To give an example of how easy it is to lay claim to great savings when in reality these savings should be credited to the march of progress and invention, I would call attention to another statement of the speaker at the Riverside meeting. In speaking of the rate reductions claimed by the more economic operation of the Hydro Commission, he said:

"If the rates are reduced, and the consumer pays less for the service he received, that reduction, I maintain, is the consumer's dividend, just as much as if a check were handed to hum by the municipality each month for the amount of the reduction in his power and lighting bills for the service which he receives, and for the current used for lighting alone. Since the hydro municipalities first began to operate, the saving in rates charged over what would have been paid at the old rates amounts to over $38,000,000.00 and at least $20,000,000.00 more on power used, or a total of over $58,000,000.00 paid to the users of power and light, the shareholders in the scheme in ten years' operation, five of which were fraught with unprecedented difficulties created by the greatest economic upheaval the world has ever witnessed."

I am wondering who will lay claim to the fabulous saving in power bills that has been accomplished in California since 1907 when the average rate paid for power generated was 2.15 cents per kilowatt-hour, according to the U. S. Census, which rate, according to the same source, was reduced to 1.55 in 1912 and 1.45 in 1917, being raised again to 1.55 in 1921. Using the same line of reasoning of the above speaker it is evident that the people of California have been paid in dividends in the form of reduced rates under the method of utility regulation that prevails in that state the gigantic total of $192,966,000.00, as estimated in the following tabulation.

YEARLY SAVING

Year	Power Generated in Millions of Kilowatt-Hours	Rate Saving Per Kw. in Cents	Dollars Saved
1921	4,386	.6	$26,316,000
1920	3,661	.65	23,800,000
1919	3,311	.666	22,050,000
1918	3,037	.675	20,500,000
1917	2,783	.69	19,400,000
1916	2,356	.675	15,800,000
1915	2,168	.666	14,450,000
1914	2,025	.65	13,160,000
1913	1,901	.625	11,890,000
1912	1,653	.6	9,910,000
1911	1,401	.5	7,000,000
1910	1,208	.4	4,830,000
1909	1,050	.25	2,620,000
1908	825	.15	1,240,000
		Total Estimated Saving,	$192,966,000

Despite the fact that a dispassionate consideration of both rates and service reveals the advantages of the privately owned and publicly regulated California system, in comparison with the government owned and controlled system of Ontario, nevertheless there are those who would bring about similar conditions in California through the adoption of the proposed Water and Power Act. It is most important that the true facts be widely disseminated.

California's Prosperity Depends on Future Supplies of Fuel

Industrial Growth in California Depends Upon Availability of Fuel and with the Exhaustion of Present Oil Fields Coal Must Be Imported in Connection with Export Trade Development

By C. H. DELANY

Extracts from a paper read before the San Francisco Section of the American Society of Mechanical Engineers

A RECENT joint survey made by the United States Geological Survey and the American Association of Petroleum Geologists, estimates that the quantity of oil recoverable by present methods remaining in the ground in California on January 1, 1922, including known and probable fields, amounts to 1850 million barrels. For some years the production of oil in California has been in excess of 100 million barrels per year, so that it appears that if the present rate of production could be continued, the oil supply would be exhausted in less than twenty years. The estimate represents the best judgment of the geologists, but unknown fields may be discovered in the future, so that it is impossible to predict with any degree of certainty how long the oil supply will last. It seems inevitable, however, that some day, perhaps ten, twenty or forty years hence, we may find ourselves without a sufficient quantity of oil to meet our needs as fuel.

While it is true the development of new oil fields in the state may increase the total supply of oil, it is also probable the development of methods of oil refining will in the future make available more and more of the oil for gasoline and other valuable products and leave less for fuel purposes. It is also probable that the many advantages of oil for marine purposes will tend to sooner cut off the supply for many uses for which fuel is required on land. It therefore seems appropriate at this time to discuss the situation in which we will some day find ourselves when the present fuel supply is cut off.

An adequate supply of fuel for power and industrial purposes has in the past been the controlling factor in the development of industry and population. Fuel is the foundation of development, and the industrial growth of any country depends more than anything else on the availability of fuel. Nowhere can this be shown more clearly than by a study of the industrial development of California, since the oil industry developed a cheap and ample fuel supply.

The population of California has more than doubled since the year 1900 when oil production became the predominant factor in the fuel supply. In the same period the value of the products of industry has increased over six times. It has been estimated that at the present rate of growth there will be a population of ten millions in California by the year 1950.

California Oil Production

The production of California oil, as shown by the records of the State Mining Bureau, has increased from 4,329,950 barrels in 1900 to 114,800,000 barrels in 1921. About 8 per cent of this is used as fuel in the oil industry itself, and over 80 per cent of the remainder is distributed as fuel to the industries of California and other states. The most reliable data on distribution and uses of California oil are found in the Report of the Committee on Petroleum of the California State Council of Defense, published in July, 1917. The following data, obtained from this report, indicates the territory served by California fuel oil in 1917:

Distribution of California Fuel Oil
(Crude and Residuum)

	Bbls. per Month	Per Cent
California	4,467,000	63.8
Washington-Oregon	1,090,000	15.6
Canada	326,000	4.7
Arizona	346,000	4.9
Nevada	85,000	1.2
Mexico	50,000	0.7
Central America	156,000	2.2
South America	299,000	4.3
Hawaii	132,000	1.9
Alaska	37,000	0.5
Miscellaneous	12,000	0.2
Total,	7,000,000	100.0

The following table shows the purposes for which oil was used as fuel in California during the year 1917:

Fuel Oil Used in California (Alone)
(Crude and Residuum)

	Bbls. per Month	Per Cent
Railways	1,956,000	43.8
Steamships	555,000	12.4
Public Utilities	655,000	14.7
Mining and Smelting	52,000	1.8
Industries	483,000	10.8
Lime and Cement	158,000	3.5
Sugar Refining	103,000	2.3
Agriculture	73,000	1.6
Heating Buildings	150,000	3.4
Miscellaneous	282,000	6.3
Total,	4,467,000	100.0

It is thus seen that in 1917 the quantity of oil used as fuel in California amounted to 4,467,000 barrels per month, or at the rate of 53,604,000 barrels per year. On the basis of 3½ barrels of oil to one ton of coal, this quantity of oil is equivalent to 15,300,000 tons of coal. In addition there were used in 1917 in California over 700,000 tons of coal, bringing the total annual fuel requirements of the state up to an equivalent of 16,000,000 tons of coal. The population of California in 1917 was somewhat over 3,000,000, so the fuel requirements amount to about 5 tons of coal per capita. This compares with an average coal consumption throughout the United States for the year 1920 of 5.7 tons per capita. It is evident, therefore, that if the growth of California is to continue at the present rate, producing a population of 10,000,000 by 1950, and if the supply of California oil is cut off, we shall require by that time for fuel purposes the equivalent of 50 million tons of coal per year.

Hand in hand with the development of the oil industry has gone the development of the hydroelectric power industry, which is of course also

responsible in a large part for the development and growth of California during the last 20 years. There is an impression among many that hydroelectric power will serve as a substitute for fuel and that when our oil supply has been used up we shall simply have to turn to the "white coal" of the Sierra Nevada Mountains.

There are many industries, however, that cannot do without fuel of some form, regardless of the quantity of electric power available. Of the 655,000 barrels of oil used per month by public utilities, probably at least one-half was used for the manufacture of gas. Gas is a direct product of the oil itself, and if oil is no longer available some other fuel must be substituted for it. Lime and cement works used 158,000 barrels per month. Electric power is already used extensively in these industries for operating the machinery, but fuel of some sort must be used in the kilns themselves. Heating by electricity is a possibility, but electric energy is of far greater value for the production of power than for the production of heat, and it is certain that the heating of buildings and industries requiring heat such as fruit canning or sugar refining will continue to demand an adequate supply of fuel.

Even if it were practicable to substitue electric power for all the industries which are now using fuel oil, it must be borne in mind that there is a limit to the quantity of hydroelectric power available. H. G. Butler, former Power Administrator for the state of California, has estimated (Journal of Electricity and Western Industry, June 15, 1921) that the present rate of growth of the hydroelectric power industries, the economic limit of hydroelectric development in California will be reached in the year 1941. This limit of course, will be reached sooner if hydroelectric power is substituted for fuel oil wherever practicable, such as by electrifying the railroads and by the greater use of electric power in industry.

On the other hand, future developments in transmission engineering may make it economically possible to bring power into California from distant sources, thus postponing the date of reaching the economic limit. Undoubtedly, the more rapid the development of hydroelectric power, the longer it will be before our fuel oil resources are exhausted; but, as a matter of fact, this is merely postponing the inevitable, and it is obvious that after the limit of hydroelectric power is reached the fuel requirements will increase faster than ever if the development of the state is to continue.

The question, therefore, is what kind of fuel is to be used after the California oil is exhausted, and where is it to come from? At first thought, it would appear that fuel oil may be imported from other countries. However, on investigation we find that the petroleum supply of the whole world is quite questionable and cannot be depended upon to last more than 20 or 30 years, and as California would be in competition with the rest of the world for its use, we cannot count on a supply of imported oil that would meet our requirements. Natural gas is available in certain sections of California, but its use is only local in these particular sections, and it cannot be considered as a fuel supply for the whole state; moreover it is probable that the natural gas supply will be exhausted sooner than the oil supply.

Coal Is Only Alternative

We must, therefore, turn to coal as the only reliable fuel for the future, and the problem therefore becomes a question of where can the required supply of coal be obtained at the least expense and in a manner best suited to our own development.

The United States is richly endowed with an apparently inexhaustible supply of coal, containing, it has been estimated, almost forty per cent of the total world supply. These coal deposits are distributed very widely throughout the country, but the quality of the coal varies greatly in different states. Coming farther west we find the vast deposits of lignite in North and South Dakota, Colorado and New Mexico, with a few isolated deposits of bituminous coal in Montana, Wyoming and Utah, and a small amount of anthracite in Colorado. It is not surprising therefore to find that the coal deposits of the Pacific States are almost entirely low grade lignites, high in moisture and ash and low in heating value.

A very complete survey of the coal resources of the world was made by the International Geological Congress held in Canada in 1913. Their report includes estimates of the area of coal fields and the quantity of coal available in the ground in various parts of the world. From this report the following information has been selected, applying to the Pacific Coast and neighboring states:

Coal Reserves of Western States

	Area, Sq. Miles		Estimate of Original Amount of Coal, Million Metric Tons	
	Known Coal Fields	Possible Coal Fields	Low Grade Lignite or Sub-Sub-Bituminous	Fair Grade Bituminous
California	10	30	15	25
Oregon	90	140	907	.....
Washington	1800	.....	47588	10355
Idaho	230	1000	90	544
Nevada	.....	.....	.....	.....
Utah	3646	.....	141	1630
Arizona	3610	.....	12832	9
New Mexico	13220	.....	156903	17173

It will be noted from the above that the supply of coal in California is insignificant. There are four coal fields in California from which coal has been produced in commercial quantities, although the production has been reduced to little or nothing since the advent of fuel oil.

Characteristics of Western Coal

California coal is low grade lignite, running from 9,000 to 12,000 B.t.u. per pound. Owing to the small quantity available it need not be given serious consideration as a substitute for fuel oil.

Oregon has a considerable supply of low grade lignite in the Coos Bay region, much of which has been imported to California in former years, although the output from the Oregon mines has always been small. Owing to its low grade it would not be a satisfactory source of supply of fuel for power purposes, although it has met with favor when used for domestic purposes.

The state of Washington has available large quantities of coal of a variety of grades. In this respect it differs from the other Pacific Coast states.

Anthracite and a good grade of semi-bituminous coal are found near the Cascade Mountains. The deposits of anthracite are small and, owing to lack of transportation facilities, do not have an important bearing on the present subject. Bituminous coal is mined extensively and is of fair quality. Large deposits are found to the west of the Cascade Mountains, within 50 miles of Puget Sound. Sub-bituminous coal or lignite, is found extensively within a few miles of Puget Sound, but cannot be transported without losing much of its heating value. The development of the mines of both Washington and Oregon has been kept back on account of the competition of California oil. It is probable that when developments are made on a large scale that Washington coal will prove one of the main sources of supply for California in the future.

Most of the coal now used in California comes from Utah, which state has a large supply of fairly good grade bituminous coal. Many mines are now in active operation and coal is one of the principal resources of the state. However, owing to the high freight rate this can never be a cheap coal on the Pacific Coast.

New Mexico has abundant reserves of coal. The San Juan region alone, which is in the northwestern part of New Mexico and is tapped by the Santa Fe Railroad, is estimated to contain over 150,000 million tons. Some of this coal now finds its way into California, but as it is a poorer grade than the Utah coal and must absorb as high a freight rate, it is not likely to become a serious factor in the fuel supply for California. In 1918 about 7 per cent of the coal used in California came from New Mexico.

Practically no coal is now mined in Arizona, Nevada or Idaho. The coal fields are mainly inaccessible or produce coal of an inferior quality.

Possibilities of Alaskan Coal

The most promising supply of high grade coal for the Pacific Coast is in the territory of Alaska. Alaska is rich in coal deposits which have been divided in the Survey into three sections, namely, the Pacific Coast section, the Interior Region and the Arctic Slope. For the purposes of this article only the Pacific Coast section need be considered. This section, which is in the southern part of the territory bordering on the Gulf of Alaska, contains 458 sq. miles of known coal fields and over 8,000 sq. mi. of possible coal fields. The coal available is of all character, from low grade lignite to the highest grade semi-bituminous and anthracite. The quantity available is estimated as follows:

Alaska-Pacific Coast Section

	Estimated Amount of Coal Million Metric Tons
Lignite	1971
Sub-Bituminous	485
Bituminous	2
Semi-Bituminous	1293
Anthracite	1931
Total,	5682

No coal has as yet been exported from Alaska, but it is probable that this will eventually become one of the main sources of coal for the Pacific Coast, especially for such purposes as require the higher grades of coal.

Turning now to the possibility of importing coal from foreign countries, we find that the nearest foreign coal available is that on Vancouver Island. Much of this coal, which is a fair grade of bituminous coal, has been imported into California in the past from the well known Wellington Mine. There are 185 sq. miles of known coal fields, with possible 645 sq. miles. The quantity of coal available is estimated at 5,191 million tons. Large reserves of coal are also found on the mainland of British Columbia.

Turning to South America, we find a good grade of bituminous coal located in Chile. This coal is near the coast and could readily be shipped. There is also in Chile some anthracite coal of excellent quality. There are 680 sq. miles of known coal fields in Chile, and the quantity of coal available is estimated at 2,000 million tons. In Peru there is also an abundant supply of coal, although very little is mined at the present time.

With the present development of commerce with the countries so far considered, if large importations of coal were made there would be no return cargo for the ships carrying it. In other words, unless commerce can be developed to such a point as to bring about a considerable export trade from California to Chile or Alaska, as the case may be, the cost of transportation of coal would be doubled by the necessity of sending the ships back in ballast. It is thus evident that the question of future coal supply for California is intimately associated with the development of her export trade. This leads us to consider the possibility of importing coal from countries at a greater distance, with which trade is most likely to develop. Previous to the development of the California oil industry coal was imported from Australia, Japan, England, Wales and Scotland, as well as from British Columbia. A large fleet of sailing vessels brought coal to California as ballast and went away laden with wheat. The future development of commerce will bring about a similar condition, for as long as our exports are greater in bulk than our imports, vessels will be looking for return cargoes, and they will bring coal as soon as there is a demand for it.

Some of the world's greatest coal deposits are found in China. It is estimated that China contains 999,000 million tons of high grade coal, amounting to about one-fifth of the total world's supply. Half of this coal supply is supposed to be anthracite. Some of the coal fields are located fairly near the coast, so that with the cheap labor available in China for mining it would be possible to ship the coal at a low price.

To sum up, while the exhaustion of our oil fields will deprive us of a native fuel, there is no cause for alarm. Domestic coal can be secured from Washington and from Alaska, where there is a supply sufficient to last us for hundreds of years. Besides this, our ports are open to the commerce of the world. The demand for coal will assist our trade by providing a return cargo for our ships, and the greater our export trade the easier it will be to secure an adequate supply of coal.

Federal Highway Appropriation Will Benefit Western States

Development of New Roads and Trails in the National Forests in the Eleven Western States Will Make Scenic Recreation Grounds Accessible as well as Assisting Greatly in Fire Protection

THE National Forests contain a total of more than 156,000,000 acres of land in the ownership of the United States and embrace much of the most rugged, densely timbered and least developed regions of the country. By far the majority of this acreage lies in the eleven western states. The need of a complete system of roads and trails for the protection, management and development of these vast regions is obvious.

The work of providing an adequate system of roads and trails in the National Forests has been progressing steadily since 1905 when the Forest Service became charged with the administration of these regions. Early appropriations were small, however, and it was not until recent years that impressive progress has been made upon the work. Appropriations previous to that in the Federal Highway Act of November 9, 1921, consists of $19,000,000 under the acts of 1916 and 1919 and also a provision in an act of 1913 which permitted the Forest Service to use for improvements 10 per cent of the receipts each year from the sale of timber and other Forest products. This latter fund has amounted so far to slightly more than $3,000,000. Under the past appropriation there has been expended about $20,000,000 but a great deal of work still remains to be done. According to the best estimates prepared by the Forest Service there are about 5400 miles of road still required to complete the state highway systems traversing the National Forests or contiguous to them. About 8500 miles of roads are needed to complete the county highway system within the forests. Additional roads required principally for the protection and utilization of the resources of the National Forests aggregate more than 13,000 miles. Aside from the roads, the pack trails needed in the National Forests, principally in connection with fire protection work, will entail about 40,000 miles of further construction. The total cost of providing all these transportation facilities will involve an outlay of approximately $140,000,000.

Of the $15,000,000 recently apportioned by the Secretary of Agriculture among 27 states, Alaska, and Porto Rico for the construction of National Forest roads and trails, $9,500,000 known as the "National Forest Highway Fund" is set aside for roads of primary importance to states, counties and National Forest communications; $5,500,000 constituting the "National Forest Development Fund" will be used for the construction of roads and trails needed for the administration and utilization of the Forests themselves.

These appropriations will give a new impetus to the work of opening up vast tracts of valuable timber and areas of scenic beauty for the use and enjoyment of the American people. The development of roads and trails throughout the Forests will aid materially in fire protection. At present there are large areas of trackless wilderness within the National Forests that can not be reached by trails. When lightning storms sweep over these inaccessible areas, heavy fire losses of public timber often occur.

Speed in reaching a forest fire is just as important in protecting the country's forests as is speed in city fire protection. But high speed within the National Forests means 4 or 5 miles an hour over a mountain trail. If no trail exists it is often impossible for the fire fighters to average more than one-fourth of a mile in an hour.

In the past, construction of many urgently needed forest roads has been deferred for lack of sufficient funds. Much of this work can now go forward.

The distribution in the eleven western states of the "National Forest Development" and "National Forest Highway Funds" is as follows:

State	National Forest Highway Fund $9,500,000	National Forest Development Funds $5,500,000	Grand Totals
Arizona	598,189	280,722	878,911
California	1,460,871	703,822	2,164,693
Colorado	717,058	336,360	1,053,418
Idaho	1,097,894	1,088,656	2,186,550
Montana	878,886	574,615	1,453,501
Nevada	207,984	55,377	263,361
New Mexico	458,258	219,652	677,910
Oregon	1,157,109	718,555	1,875,664
Utah	371,776	164,258	536,034
Washington	708,133	602,889	1,311,022
Wyoming	479,000	267,101	746,101
Totals,	8,135,158	5,012,007	13,147,165

Many large areas are still entirely without even the simplest trail facilities. Valuable forests which will be urgently needed in the future are being jeopardized by reason of the fact that they are without adequate roads or trails by which fire-fighting supplies and men may be brought in in case of need. The primitive conditions existing on some of the Forests are but little realized. Many sections are entirely without roads, while others are served by roads which are simply wagon tracks through the woods, and are narrow, dangerous, steep, and entirely unsuited to travel.

During the past five years the average annual loss of National Forest timber by fire was approximately $1,500,000, and the cost of extinguishing fires about $1,200,000. An adequate system of roads and trails would materially reduce both items, would be of great public utility for general travel and traffic, and would further serve the public by lessening the destruction of resources essential to local prosperity. The system of transportation should be completed at the earliest practicable date consistent with other pressing public needs.

Fires will not await our convenience. Next to the integrity of the title to the soil itself, nothing more vitally affects the future of our National Forests than adequate protection from fire.

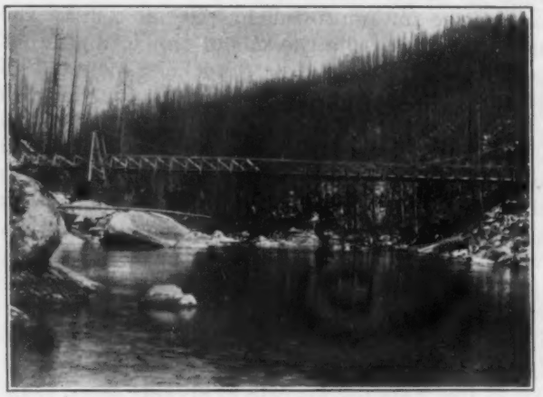
Federal Road Funds Shared by National Forest States

One of a Pictorial Series Featuring Interesting Applications of Electric Service, Advances in Home, Industrial and Power Construction and Noteworthy Developments in Western Progress

Road built by the Forest Service down Kootenai Canyon in Montana. The Secretary of Agriculture recently apportioned $15,000,000 among 27 states for the construction of such roads and trails in the National Forests.

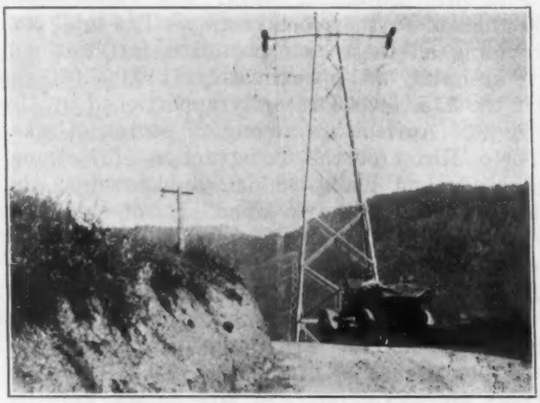
Diamond Lake, near the summit of the Cascades in the Umpqua National Forest in Oregon. It is such scenery as this that the Forest Service will open up to the public through the construction of roads and trails.

Pacific Highway bridge in the Umpqua National Forest, built by the Bureau of Public Roads in cooperation with the Oregon Highway Commission and the Forest Service.



A popular type of suspension bridge erected by the Forest Service in the Clearwater National Forest in Idaho. This view shows the result of forest fire devastation.

Forest Service trail in the Angeles National Forest in California. The development of roads and trails throughout the forests will aid materially in fire protection as well as open up areas of scenic beauty for campers.



Where the Southern California Edison Company's power line crosses the Forest Service road in the Sequoia National Forest in California. Most of the recent appropriation will be expended in the eleven western states.

Self Improvement in Salesmanship

A University Study Course for the Man who Meets the Public in Every Line of Business

THE RETAIL SALESMAN

How can the salesman learn to analyze his abilities, and his own needs, and how, by such means, can he improve his methods, increase his earnings and give better backing to a firm's advertising?

The modern salesman is finding it a little bit more difficult to increase his income than the average union laborer. This is because many firms are now basing salaries on net returns.

Some stores sell on a 4 per cent basis, some as high as 8 per cent, while many pay only 2 per cent. Regardless of the commission, the salesman must sell more merchandise if he is to increase his income, and the only way that he can make these increases is carefully to study the four general divisions which thousands of other salespeople have studied in the last ten years. They are:

1. Appearance
2. Language
3. General Intelligence.

As to appearance, almost every large department store now has a standard for their saleswomen. Why they never studied the appearance of their salesmen is something I have never understood. In the clothing and shoe fields a great deal of progress has been made in the general appearance of the salesman.

I have always believed that these things should be carefully considered by a salesman—first his haircut, then the collar, shirt, clothing, shoes, and the appearance of his face and hands.

Out of a group of a hundred salesmen, you will seldom find more than ten men who are well groomed and who have a clean appearance.

A sales conference in New York at one time analyzed more than 100 men, having other men pass on the men examined. Eight men had hair cuts that passed; twenty had collars that were the right size and right style; ten had neckties that harmonized with their shirts; fifteen had shirts that fitted and were of the right sleeve length; twelve had suits that fitted and were pressed and clean; while only eighteen had shoes that fitted with heels that were not run down.

It is hard to criticize a salesman's appearance, but if the salesmen and saleswomen are not carefully groomed, absolutely clean from head to foot, and trim in appearance, they lose greatly as the customer approaches them.

Any salesman can dress better for the same amount of money. The trouble with most salesmen is that they compromise and buy cheap things. They do not study colors and almost invariably, they are too "flashy." If their appearance is right, customers sense it very quickly, and the customer unconsciously buys more readily.

Now, as to language—there are more than 600,000 words in the English language, but the average salesman uses less than 5,000 in his daily selling.

There are four simple ways of improving his English.

First, study grammar, using a simple book.

Another method of improving your language is to read books rich in descriptive matter, such as those which Dickens wrote. Dickens was an artist in describing things. Of course, the stories are good in themselves, but the idea is to learn how to describe things accurately and create mental pictures for the customer.

Another way to improve your English is to write continuously. Sit down every night and write two or three advertisements on the merchandise you are selling. Show them to your wife or to your associates in business, and get them to criticise them. Writing six advertisements a week of 100 words each, means that you have written 600 words each week, and if you continue it every week for a year, you will write 30,000 words in a year. This would show how meager is your vocabulary.

Another method is to cultivate the acquaintance of lawyers, preachers, men of college educations. Spending a half hour or so with such people will show you the importance of clean, pure, business English. These people were compelled to study good English. They had to go through college to get their degrees. They associate with people who talk pure English.

If a salesman's appearance is 100 per cent and his language is accurate, clean, and free from slang, he has an advantage over the other salesmen, who are careless about their appearance and pay no attention to their vocabularies.

A successful salesman should also have general intelligence. By general intelligence is meant that the salesman must study merchandise. Salesmen selling underwear would never attempt to sell a man from ten to twenty suits at the beginning of the season. Yet there are thousands of men who don a clean suit every morning. A salesman who uses two suits during the week can't understand how anyone could be so extravagant. You have got to live the lives of other people mentally if you are going to sell them large quantities of merchandise.

Women think nothing of buying three or four hats, or as many as a dozen, during a season, while many men never think of buying more than two hats during the year; straw for the summer and soft or stiff for the winter.

If you get out of your own environment and improve your general education regarding people you will find that there are hundreds of reasons why a man should buy four hats a year instead of two. You will find the importance of selling women a full case of canned tomatoes instead of two cans.

One of the reasons why the salesman in the average store is so far behind in his selling education work is because schools have never been established for him. Manufacturers pay little attention to him, while the average employer is always afraid he is going to ask for more money. In the more progressive stores, the employer is glad to encourage his sales people to expect more, based on their actual sales.

The salesman of the next generation is going to lift himself entirely out of the groove of present day salesmanship, and I think he will do it largely by studying his own appearance, his own language and his general intelligence. Improvement must and will come through his own efforts.

Classification of Customers

The customers today are radically different from the customers of ten years ago. We may divide them into several different classifications, along such lines as:

1. Age
2. Sex
3. General Education
4. Income
5. Temperament.

When we consider customers from the standpoint of age, we may classify them as follows:

1. Infants under seven months
2. Children from 7 months to 2 years
3. From 7 years to 14 years
4. From 14 years to 18 years
5. From 18 years to 25 years
6. From 25 years up to 45 years
7. From 45 years up.

From two to seven, the child shows some preference of its own, so that you are selling a young customer as well as the mother. From seven to fourteen, the salesman has to make two sales; one to the child, and the other to the mother. How few salesmen realize this. From fourteen to eighteen, the buying is almost all done by the young man or woman. From eighteen to twenty-five, our customers change radically, because during this period they are both buying things and doing things to please the opposite sex. From twenty-five to forty-five, you find most people married, and you have an entirely different type of customer. Every dollar must be accounted for during this period. From forty-five up, you have either very good or very poor customers. If the customer has made good, and has money, it is a very easy matter to hold his patronage. Old customers do not change about, providing you give them service.

As to sex, psychology has shown us that girls are brighter than boys up to nine or ten years. From then on, they run neck and neck, excepting in scientific study, where the boy seems to have the advantage of the girl. As they finally develop into men and women, from eighteen to twenty-five, there is no difference in their mental activity, except that women know and are more susceptible to reason-why arguments. They shop about more. Men are in a hurry. They go in one place and buy, even though they don't see just what they want.

The income of the customer must be studied if you are to make a success of your business. The poorer sections of the town always have few telephones, so that a store in the poorer section has got to depend upon people coming and carrying away their own goods.

There is a radical difference in the temperament of customers. An Italian settlement is different from a Norwegian settlement. A Southerner is different from a close buying New Englander. But as you study customers, you find that all of them can be classified under three headings:

1. Mental type, those who think, reason, and listen to arguments.
2. The muscular type, who think, but not so much as the mental type. They are active, aggressive and make quicker decisions.
3. Vital temperament type, who are stout, well built and who do do not believe in hard work. As a rule, they are sharp customers, know values, and they are good advertisers for the salesmen. More than one salesman has built up his reputation through selling fat customers. Fat people generally talk a good deal and are good word-of-mouth advertisers of anything which they like, be it food, drinks, or sales people.

In the last 15 years, selling schools organized by manufacturers have worked remarkable changes in the selling capacity of department stores, specialty shops and general stores. For the first time in the history of business, store owners have realized the importance of having service which would attract customers, and hold them.

Weakness in their selling plan for the year can almost always be traced to the poor service on the part of the salespeople.

This article is not one of the series by Prof. William A. Russell, whose next lesson will appear in the April 15th issue.

SMALL LIGHTING PLANTS POPULAR ABROAD

Compact and simply operated American electric-lighting sets for household, estate, or club installation find a good sale overseas, though just at present the demand is light, due to unfavorable conditions in the more likely markets. Gasoline and kerosene engines are the prime movers usually preferred, and storage batteries are a regular part of the equipment in most instances, especially in the case of smaller sets.

Direct-connected and belted units are both sold, the former having a more general demand. Installation conditions are such that direct-connected units probably give the most satisfactory results. Air-cooled engines have on the whole given good satisfaction, but many foreign engineers handling small lighting sets have expressed a general preference for water-cooling. Plant capacities range from ¾ kilowatts to 5 kilowatts, with growing call for somewhat larger sets, and in some instances a demand for ½-kilowatt units for household installation.

The voltage most commonly employed in the past has been 32 volts, but the success of individual lighting installations has led to their use in classes of work where this voltage is hardly sufficient, and 110-volt equipment is frequently called for.

Increasing Production in Industry

Shortcuts in Management and New Power Applications That Have Reduced the Cost of Manufacturing Processes or Increased the Rate of Production. Ideas and Suggestions by Practical Men.

Electrical Steam Generator Has Possibilities in the West

An electric steam generator, utilizing the principle of heating produced by resistance to flow of electric current through water, especially applicable to the West, has recently been placed on the market by the Electric Furnace Construction Co., Philadelphia. It is called the "Electro" steam generator.

Steam is generated at any specified pressure by means of high tension alternating current led directly through electrodes of special design into the water to be evaporated. A vertical tank is used, constructed according to approved boiler practice. The whole apparatus occupies only a fraction of the space required for fuel fired boilers and the cost of installation is very much less.

The amount of steam generated, the pressure and amount of electric power used are governed by the height of water in the vertical tank. This is controlled and regulated by standard valves, rendering the whole operation practically automatic.

Any water that is suitable for the ordinary boiler is satisfactory and it is not necessary to install water-softening apparatus. Either condensate or raw water can be used or a mixture of the two. No part of the steam generator is exposed to a higher temperature than that of the steam, and the only part subject to slight wear is the electrodes, which may be replaced annually at a nominal cost. There is no scaling or erosion of tubes or shell due to high temperatures.

The most important application of the "Electro" steam generator will be found in industries located within the range of hydroelectric power plants, where use may be made of surplus energy or water running to waste. Due to the inability of ordinary power consumers to operate 24 hours per day, the load factor at most power plants runs from 60 to 80 per cent. Complete use may be made of this off-peak load, which is not now used, by the installation of this type of steam generator, and the load factor of the power station can be considerably improved. The generators operate with 98 per cent thermal efficiency and unity power factor. It is very flexible and it can be paralleled in with existing coal or oil-fired boilers and just operated on these off-peak loads—when cheap power can be had One large installation operates only on Saturday night and Sunday, and the resultant saving in coal paid for the whole cost in one season. In some cases hydroelectric power companies are taking advantage of their surplus power and install such steam generators in central locations and distribute steam to a number of nearby industries, selling steam at a fixed rate per 1000 lb. In other cases, where an individual customer is a large user of steam, the power company has installed the generator in the customer's plant.

The chief advantages claimed for such a steam generator are that the initial and operating costs are very much lower than on oil-fired boilers, the space occupied is much less, there are no expensive buildings, smoke stacks, storage for oil or coal, no fuel or ash handling equipment, no mechanical stoking devices or water softeners.

A number of large generators have been in successful operation for some months and already over 100,000 kilowatts of generators, representing 10,000 boiler horsepower, are running or being installed of the type here described.

THIS DEPARTMENT

will be devoted to a discussion of practical problems of industrial operation and management. Readers' requests for information will be published in each issue, together with the answers to previous questions. It is hoped that readers will take full advantage of this opportunity to profit by the practical experience of others and to give others the benefit of their own discoveries. Space rates will be paid for answers which are published.

Automatic Station Control Meets Increased Load Demand

A progressive step to meet an increased demand for electric power for general lighting and industrial use has been taken by the Ontario Power Company, Ontario, Cal., by the decision to install a remote control automatic water wheel equipment at a new hydroelectric power station on its system.

The company engages primarily in irrigation work, but by combining the flow of water for this purpose with generating apparatus it has been able both to regulate the flow in accordance with the irrigation requirements and create additional electric energy as a by-product.

This power is sold direct to the consumer in the company's territory or in case of a surplus, is disposed of to other companies serving more remote sections.

The water wheel in the new station will be controlled from the company's main station two miles distant, by a switch actuating a set of contactors which control the motor operated needle valves in the water wheel nozzles. This serves to regulate the amount of water which is allowed to flow through the water wheel at any time.

This is the second installation of its kind on the company's system. In 1919 power house No. 2 was equipped for similar automatic operation. The new equipment, which has been ordered of the General Electric Company, consists of a 2300-volt, 400-kva. generator driven by a Pelton water wheel with a direct connected 12-kw., 125-v. exciter, and automatic control apparatus as explained above.

Increasing the Efficiency of the Purchasing Department

Telephone conversations to members of the purchasing department from employers with whom requisitions originate have been simplified by the Utah Power and Light Company to such a degree that an inestimable amount of time and money has been saved by the application of a simple procedure in making out purchase orders.

All purchasing department orders were numbered and carbon copies were sent to employes and other company members who might be interested in the purchase, thus automatically advising them of the placing of the order, the purchase price and the promised date of delivery. If written or telephone communications later developed, the order number was referred to, but considerable delay and confusion resulted in attempting to refer to the particular purchasing department employe with whom the order originated, and therefore best qualified to give information regarding it. As the department handles from twenty to thirty thousand orders per annum it can be readily seen that any procedure which might solve this difficulty would be a great time and money saver, as well as increase the efficiency of the department. When heavy construction was in progress and calls coming in from all parts of the thousand miles of private telephone lines operated by the company, the confusion at times threatened to disrupt the purchasing department.

The difficulty was finally solved by simply placing the initial of the last name of the person who made out the order after the order number. Ninety-five per cent of the difficulty has been eliminated. All employes are advised when calling regarding an order to ask for the purchasing department employe whose initial appears after the order number.

A. D. SMITH.
Utah Power and Light Co.

The Eight-Hour versus the Twelve-Hour Shift

Results of a Nationwide Survey by the Federated Engineering Societies Shows Shorter Shift Is Most Efficient

More than 500,000 shift workers are employed in American industries, according to a report of the Committee on Work Periods in Continuous Industries of the American Engineering Council of the Federated American Engineering Societies made public recently.

Chairman H. E. Howe of the National Research Council said that the conclusions of the committee are based on a nationwide survey of "an unexplored field" conducted under the direction of Dr. Horace B. Drury, formerly of the faculty of the Ohio State University. The survey is now complete with the exception of certain regions of the South and far West.

Labor efficiency, it is indicated, is higher with three shifts of eight hours each, than with two twelve-hour shifts. Contniuous operation, according to the engineers, was found to constitute a great social and industrial problem about which almost nothing is known either by labor, the employe or the public.

"While the committee plans a further engineering study in the steel industry," says the report, "its investigations to date have been in industries other than steel. It has been found that the extent of continuous-operation industry outside of steel is greater than had been supposed. There are well up to 40 or 50 industries which involve a greater or smaller amount of continuous operation, in all or a portion of the country's plants.

"These industries include many that are technically of great importance. In fact, as a class, they underlie a large portion of present day industry, many if not most materials having at some point to undergo continous-operation processes or services.

"Four chief causes of continuous operation may be distinguished. One group is made up of what may be called heat-process industries, these industries falling into two main subdivisions, the metallurgical and the ceramic. Another group is made up of chemical industries, though many of the industries in other groups are also to a large extent chemical industries. A third great cause of continuous operation might be termed heavy equipment or elaborate equipment. This cause operated to a greater or less extent in the case of almost all the continuous industries. It is a chief cause of continuous operation. Group four is made up of public service industries.

"In most of the continuous industries the number of employes engaged on shift work is not as large as might be supposed, because continuous operation usually comes at a stage where it is possible for a few men to handle a large tonuage of materials. The extreme example of this is in the water supply of New York, where some 300 men on shift work, daily pump some four or five hundred million gallons of water.

"Nevertheless, there are so many of these continuous industries, and many of them are of such substantial size, that, taken all together, the great steel industry probably does not account for more than a fourth or fifth of the total of shift workers. Some of the larger industries, outside of steel, are now predominantly on eight-hour shifts; but all except a few of the industries still have some plants on twelve-hour shifts; and in some cases all or a majority of the plants are on twelve-hour shifts.

"Very roughly, the number of shift workers in the United States is probably well over 500,000, though likely not as large as 1,000,000. And the number of men on twelve-hour shifts, in the period preceding the depression, was perhaps not far from 300,000, of which about as many were outside the steel industry as in the steel industry.

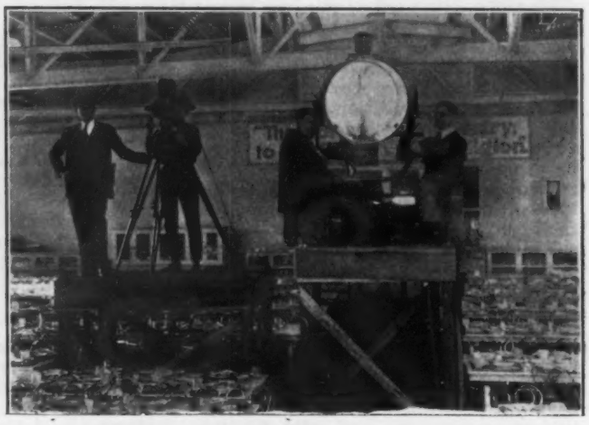
"The committee has been endeavoring to chart what is practically an unexplored field. Though the continuous industries other than steel present an important problem in operation to their managers and an important social problem to the public, the extent and even the existence of this problem has practically escaped notice. The managers of continuous plants and others interested in the industries, usually know little of the situation outside of their own plant, or the very few plants that have come to their attention. Employ- have come to their attention.

"It has been found that the results which have followed the substitution, say of three shifts for two shifts, have varied enormously from plant to plant. Probably in most of the plants which have changed in the last few years from two shifts to three, efficiency was not greatly improved; but to a large extent this was due to the unsettled and unfavorable labor conditions which prevailed down to a recent date. Even so, the increase in cost due to three shifts has apparently not been large enough to be a serious handicap in competition.

"Three-shift plants have maintained themselves in the same markets with two-shift plants. And even during the very serious depression of 1920 and 1921, and the strong temptation and tendency to link reduced wage rates with lengthened hours, very few plants have gone back from eight-hour to twelve-hour shifts.

"There have been instances in all types of continuous industries of companies which have gone to three shifts with striking gains in efficiency, either through reductions in the number of men required per shift, or through increase in output, or through heightened efficiency in other ways.

"Taking the continuous plants as a whole, the long run as opposed to the immediate effect of going to three shifts will probably be a substantial increase in labor efficiency; but not so great an increase in efficiency—barring exceptional plants—as to permit the paying of as high weekly wages as men would receive for twelve-hour work, without increasing cost. But it would be possible, without increasing costs, to pay the men a weekly wage which, once they had become used to the eight-hour shift, they would much prefer to the alternative of a twelve-hour day and twelve-hour wage."



ELECTRICITY AND THE MAKING OF INDUSTRIAL MOTION PICTURES

Large industries are realizing the importance of educational motion pictures as a means of publicity and advertising. More and more large firms are realizing the value of such a procedure. The two views above show operatives from the Rothacker Film Company of Chicago taking pictures in a large industrial plant, as well as illustrating the use to which electricity is put in the making of these pictures.

Western Dealer, Jobber and Agent

Business building suggestions for the store — Distribution and warehousing methods — Advertising and sales promotion ideas

The Electrical Industry and the Radiophone Boom

A Discussion of this Latest Electrical Development with the Merchandising Problems It Has Brought

By H. C. HOPKINS
Dolman & Hopkins, San Francisco

Like an oil boom or a gold rush there has swept over the country almost over night an unprecedented avalanche of interest in the radio telephone. Prior to last November, it is estimated that there were approximately 30,000 bona fide radio enthusiasts in the United States. Secretary of Commerce Herbert C. Hoover in a recent conference in Washington, estimated the present number of radio fans to be 600,000, with the total increasing at a remarkable rate.

And like an oil boom or a gold rush, the present demand for radio apparatus threatens to get beyond the control of the present manufacturing and distributing agencies unless immediate steps are taken. Organization and stabilization in this branch of the electrical industry are woefully lacking. Without organization and stabilization, this same electrical industry is placing itself in a position to lose, not only the credit for the inception of the radiophone boom, but also a greater proportion of the profits which justly belong to it. The manufacturer, the jobber and the dealer are not looking toward the future, but are vieing with each other to reap the immediate harvest of profits. Manufacturers report orders far in excess of production and are enlarging their plants. Jobbers cannot fill their orders. The dealers' shelves are empty and the public is still clamoring for apparatus. The solution of the problem can be found in the one word which has constantly been called to the attention of the electrical industry,—cooperation.

If stabilization and organization are to be brought out of the present chaos, manufacturer, jobber and dealer must be made to realize the various phases of the problem vitally affecting themselves.

The present tremendous demand has been created primarily by the broadcasting activities of the various manufacturers. But these broadcasting activities have exceeded the expectations of the most optimistic. At the present time, not only the various manufacturers, but jobbers, dealers, department stores and newspapers have entered the broadcasting field. In the various cities of the Pacific Coast there are no less than five broadcasting stations to each of the larger communities. Time has been allotted so that the radio enthusiast may pick out of the air almost any type of entertainment, ranging from sermons and religious music on Sundays to weather reports, news, dance music and stories for the kiddies.

The work done by the broadcasting stations in the past has been highly commendable but the time is ripe for a housecleaning. And it is the duty of the manufacturer, who is largely responsible for the present boom, to be the first one to pick up the broom. The radio fan is beginning to tire of the cheap brand of "canned" music which is being served to him. No type of radio apparatus can eliminate the imperfections of the phonograph, so why continue to broadcast noisy, scratchy, squawky music? With the facilities at their command the manufacturers might well afford to broadcast perfect concerts by well known artists. The educational possibilities of the radio phone are admitted to be almost limitless. Then why not send out interesting lectures on vital topics by well known public speakers? A diversion from the present meaningless program could be brought about if even the politician were allowed to talk. The properly conducted broadcasting station offers immense possibilities for the future. It can be used to educate as well as to entertain and should be so used. Moreover it is the duty of the manufacturer of radio equipment to be the first to recognize the present imperfections and institute a change.

The distribution of radio equipment should by all means follow through the natural electrical channel, i. e., from manufacturer to jobber to dealer to consumer. The methods of distribution to date have been woefully lax. There has been none of the cooperation of the various agencies which has marked the distribution of other types of electrical apparatus. It should be the function of the manufacturer to create a demand for his product in this line the same as in any other, by consumer advertising in magazines and newspapers. In the case of the large manufacturers, this is especially true. There is also considerable room for improvement in the quantity and quality of dealer helps. Window cards and display material have been conspicuous by their absence. The dealer has paid considerable attention to window and counter displays but up to the present time he has received little or no assistance from the manufacturer or the jobber. The small manufacturer has in many instances spent considerable time and money in the development of his distributors. It remains for the larger manufacturers to follow along the same lines.

The electrical dealer must also do his share in the cooperative movement which is highly essential if the present radio boom is to be stabilized and organized. A similar condition exists in the radio field as existed in the electrical field some three or four years ago. Dealers are failing to realize that by working together they can make each other stronger. The opinion among them seems to be that they are in business to cut prices and create war on their competitors. The dealer also faces the problem of convincing the manufacturers that they are not allowing him a sufficient discount, that he cannot conduct a modern store on a discount of 15 or 20 per cent.

The time is near at hand when the manufacturer of radio equipment will have enlarged his factories to a point where he can take care of the demand for such equipment. Consequently now is the time for the electrical dealer to prepare for the seller's market which is ahead by applying the same modern merchandising methods to radio equipment that have been applied to electrical appliances with such success.

With the assistance which is being given gratis to the seller of radio apparatus in both magazines and newspapers, with an unparalleled demand, apparently unabating, a new and important phase of the electrical business is rapidly being developed. Let the manufacturer, the jobber and the dealer cooperate to the fullest extent if the ultimate benefits to be derived from this latest development are to be obtained.

Stickers on Monthly Bills Aid in Sale of Appliances

The Bend Water Light and Power Company of Bend, Ore., which claims for its city the largest per capita use of electricity of any community in the country, has adopted a novel set of stickers which are attached to the monthly bills for increasing the use of electricity and the sale of electric appliances by planting the germ of desire in the customer's mind.

Here are three examples of the stickers used:

Do You Know that your bill would be only 25 cents per month more if you used a Vacuum Cleaner every day? We will put a vacuum cleaner in your home for $10.00 down and $5.00 per month.

Do You Know that for 12 cents a day you can do all the cooking for a family of five on an Electric Range? Clean and sanitary, no ashes, no dirt. For a small payment down we will put an electric range in your home.

Do You Know that your bill would be only 15 cents per month more if you used an Electric Washing Machine every wash day? We will put a washing machine in your home for $10.00 down, the balance in nine equal monthly installments.

The JOURNAL'S RADIO PAGE—NEWS and MUSIC of the AIR

EASY TO ENJOY THE RADIO

Music, Bedtime Stories, Market News for All; Popularity Grows in San Francisco

JUST turning a few knobs on a [illegible] brought right to your fireside, [illegible] small box as one [illegible] to serve [illegible] ment and [illegible] ing sta[illegible]

No high-power electric current are necessary, no dangerous or complicated connections on the [illegible]

POST RADIOGRAMS

Special Post Radio News Service to Begin Monday Night, With Concert by Wireless Preceding the Outstanding News of Day Thruout World.

(By W. L. WINNER JR.)
(Denver Post Radio Editor.)

Tonight s the night, radio fans!
Promptly at 8:15 o'clock Monday evening the powerful radio at Fitzsimons general hospital, thru arrangements with The Post, will send out thru the night air tantalizing strains of music to enable you to "tune in" for The Post's flashes hot from The [illegible]

TODAY'S PROGRAM

The program which the Post-Intelligencer will broadcast over the radio telephone today is as follows:
12 to 12:30 p. m.—News bulletins and music.
2:30 to 3:30 p. m.—United States public health service bulletins, news bulletins and [illegible]
5 to 5:20 p. m.—Pacific coast prices at which butter, eggs and [illegible] markets will be quoted; also important news every [illegible]
6 to 7:30 p. m.—Chamber of commerce luncheon; special entertainment and music.
7:30 to 8 p. m.—Pacific coast prices at which butter, eggs and [illegible] markets will be quoted; also important news every [illegible]

RADIO PROGRAMS

The Rock Ridge Radio Station, Oakland, owned and operated by the Atlantic-Pacific Radio Supplies Company, and broadcasting on 360 meters, will send out the following program during the week:
MONDAY—2 to 3 p. m., special [illegible] porium concert; 3:30 to 4:30 p. m. regular concert; 4:45 to 7 p. m. news, financial and crop reports.
TUESDAY—2 to 3 p. m., special [illegible] porium concert; 3:30 to 4:30 p. m. regular concert; 4:45 to 7 p. m. news, financial and crop reports.
WEDNESDAY—2 to 3 p. m., special [illegible] porium concert; 3:30 to 4:30 p. m. regular concert; 4:45 to 7 p. m. news, financial and crop reports.

RADIO RADIATIONS
By FRED WOODWARD

Every day some new use for the radiophone is announced. It is now being used in hospitals for the entertainment of patients. The radiophone provides absolutely the least expensive form of entertainment for institutions like this.

The programs arranged by the big broadcasting stations are far more varied and interesting than any that could possibly be thought of by the nurses with the assistance of [illegible] phonographs with which they are usually provided.

RADIO WILL GIVE MEDICAL ADVICE

Medical advice to men on ships [illegible] on the latest development of the Pacific ocean [illegible] service is offered free by the Radio Corporation of America, the United States public health service and the Stanford University school of medicine, working in cooperation. A vessel at [illegible] wishing to consult a physician [illegible] may call the Pacific coast station [illegible] and the message will be relayed to the [illegible] service station at Bolinas, Cal., and [illegible] to the physician. Reports [illegible] will be made to the ship's captain [illegible] by the same route.

BELL-LIKE VOICE

MISS IRENE SPENCER

RADIO VOCALIST HAS FINE VOICE

Hard brilliance of voice many singers have but few [illegible] crystal clear tones of Miss Irene Spencer, who [illegible] audience of thousands o[illegible] intelligencer's radio te[illegible] night. Miss Spencer's [illegible] prano and, in coloratur[illegible] tenderly, has a bet[illegible] ness.

Miss Edna May Edw[illegible] companist, played a [illegible] background for her [illegible] should be asked of a[illegible] In addition she plays [illegible] over the radio telephone [illegible] her selected was Padd[illegible] wet."

Miss Mary Ellen Post-Intelligencer [illegible] bedtime stories for c[illegible] radio telephone in a[illegible] ter Hour. Boots tions [illegible] King" was her [illegible] since the inauguration of [illegible] The [illegible] the second. Both [illegible] the news of the day, stock reports [illegible] and an hour of music either by prom[illegible] Green's stories.

Miss Spencer's [illegible] recent [illegible] tural or visiting musicians [illegible]

Lionel Monckton, [illegible]

Letters being [illegible] experienced [illegible] for amateur [illegible] Statistics are dull things—some[illegible] times. But, sometimes, they [illegible] story more clearly than can [illegible] number of words.

Today there [illegible] telephone sta[illegible] almost 4,000 [illegible] in the U[illegible]

PROGRAM FOR RADIO GIVEN

The program which the Post-Intelligencer will broadcast over the radio telephone today is as follows:
2 to 3 p. m.—News bulletins and music.
3:30 to 4:30 p. m.—United States public health service bulletins and [illegible]
4:45 to 7 p. m.—Pacific coast prices at which butter, eggs, cheese and [illegible] markets will be quoted; also important news every [illegible]
7 to 8 p. m.—Chamber of commerce luncheon; special entertainment and music.
8 to 8:30 p. m.—Pacific coast prices at which butter, eggs, cheese and [illegible] markets will be quoted; also important news every [illegible]
8:30 to 10 p. m.—Concert by [illegible] Francisco Symphony orchestra.
10 to 11 p. m.—Concert by [illegible] Francisco Symphony orchestra.

RADIO FEATURES PRODUCTS SHOW

Wireless Instruction Course

Arranged for the Layman
By S. GERNSBACK

The first installment of this course was published last week. Back copies of the edition may be had of this office.

II.

CURRENT GALVANIC ELECTRICITY

The most successful machine of the type illustrated herewith, Fig. [illegible] in the influence static machine, which tin foil sectors have been placed. These plates revolve in opposite directions, and the current is gathered by suitable collectors. The small machine shown in the cut generates sufficient current to give a spark three inches long, under all conditions, even on a rainy day.

Fig. 4

In the foregoing installment we have only considered static electricity, which is not used extensively in commercial activities, inasmuch as it does not possess such useful characteristics as the current electricity.

Continuous or direct current is current which flows in one direction only.

Alternating current is current which flows in opposite directions, changing its direction periodically.

Pulsating current is current which flows in one direction, but is interrupted periodically.

To explain the properties of the meaning similarly electro current serve as an

Another type largely used in wireless telegraphy by virtue of its excellent constant service is the Leclanché primary cell. The electrolyte is a solution of caustic soda, while the plates are of zinc and cupric oxide. The electrolyte is usually covered with a layer of paraffin oil to prevent evaporation. While the cell furnishes only but .67 volt, it has high amperage and constancy.

After a cell has been used a short interval of time such as the first cell we described with the copper and zinc plates, the voltage is noticed to decrease to a point where it cannot be used further on investigating, it is discovered that a fine film of gas composed of innumerable bubbles has formed on the copper plate. This is known as the polarization of the cell. This gas being a nonconductor of electricity, for each low potentials are generated in a single cell causes the voltage to be considerably reduced. But fortunately there are means

Fig. 5

Fig. 6

SHORT FLASHES FROM AERIALS

SEATTLE

RADIO PROGRAM

The program which the Post-Intelligencer will broadcast over the radio telephone today is as follows:
12 to 12:30 p. m.—Program furnished by Transportation Club.
2 to 3 p. m.—Special program by Ladies' Musical Club.
3:30 to 4 p. m.—News bulletins and music.
4:30 to 5 p. m.—Public school [illegible]
5 to 5:20 p. m.—United States public health service bulletins, news bulletins and [illegible]
5 to 7:30 p. m.—Closing prices at all Pacific coast markets; also important news events and [illegible]
7:30 to 10 p. m.—Special dance program and [illegible] concert.
10 to 11 p. m.—Concert by [illegible] Francisco Symphony orchestra.

RAPID GROWTH OF RADIOPHONE IS REMARKABLE

For Every Instrument in World Ten Years Ago There Are 40,000 in America Now

BEE'S SERVICE BY RADIO BRINGS NEW STATIONS

Amateurs Report Success of Sets Installed at Nominal Cost; Many Have Music With Dinner Now; Utah Hears in Storm

RADIO SONGSTER

—Photo by Hond[illegible]

VIOLET McKAY BALL

The special musical feature [illegible] be presented by Post-Intelligencer Radiophone Service tomorrow night will be Violet McKay Ball, soprano, accompanied by Miss Myrtle Barnes. She will sing "Until," by Sanderson; "Mighty Lonesome," by Penn, and "Come Out, Mr. Sunshine," by Bliss. She is a student of David H. Ward.

MISS PARLOW PLAYS OVER RADIO

BY MARY ELLEN CAPERS.

An exquisite violin [illegible] An deep [illegible] of pathos [illegible] brilliant [illegible] [illegible] [illegible]

Selling Electric Light As An Advertising Medium

Some of the Reasons Why the Contractor-Dealer Need Not Fear a Decline in His Electric Sign Business

WHATEVER may be said of the slackness in other lighting lines, it is a fact that there is no slump in the electric lighting display field. In almost any business, when sales fall off, the advertising manager says, "Now is the time to advertise harder than ever" and the powers that be may agree with him, but they end up by saying, "Cut down on your advertising expense" and when they do, there's nothing to it but to cut and the advertising manager begins by lopping off at the points where he figures the curtailment will hurt least. But, electric signs have not been darkened nor torn down. In fact, new signs pop up like mushrooms with every passing day. It is all positive proof that the merchant or manufacturer considers display lighting as one of the most profitable and vital forms of advertising—something he simply cannot afford to curtail no matter how hard pressed for dollars he may be.

At a recent annual convention of the Associated Alvertising Clubs of the Pacific Coast, the following analysis of the average business done by the retail merchant following the installation of an electric sign, was given:

Normal business before sign purchase, 100%.
First month after sign purchase, 162%.
Second month after sign purchase, 174%.
Third month after sign purchase, 180%.
Fourth month after sign purchase, 178%.

It is possible, of course, that other conditions have had a share in creating these considerable increases in business, but the conclusion is inevitable that the electric sign has been the primary sales builder.

Another point in connection with these figures is that upstairs or second floor stores follow right along with similar average increases in business after the installation of electric signs and that restaurants, garages, drug stores and other establishments which remain open in the evening often derive an even more startling increase in business from electric display advertising.

No definite and average figures are available covering the results of electric sign advertising for the big manufacturers of such articles as automobiles, cigarettes, clothing and other nationally advertised products. While the sales results are possibly not quite so remarkable as for the local advertiser whose place of business is made outstanding by means of the electric sign, there can be no doubt that a very comfortable increase in sales is accomplished.

Whenever business starts to drop off, competition wakes up and sharpens its teeth. Merchants and manufacturers become more alert and anxious to find ways and means of putting their stores or products across with the buying public. If a big department store blossoms out with an electric sign, all the other department stores soon do likewise. Joe Popadalodous of the Parthenon Kandy Kitchen sees his shop fade into insignificance and hastens to rescue it with incandescence. And so the flood of light progresses down every street of merchants until each city and hamlet has its own Great White Way or maybe several of them, differing only from the great and only Broadway in size.

Then comes the real tussle among the merchants and manufacturers who have electric signs, each striving to turn attention to his own particular sign. Colored light is called into play and flasher effects become popular. This has gone on until it seems that the possibilities for constantly new and unique flasher and color effects have been exhausted for the present or until some new genius gives them a new impetus. So, the trend in the competition for attention in the last year or two has been towards greater brilliance. The customary five and ten watt sign lamps have been supplanted by many times more powerful light sources, all the way up to 150-watt lamps. All over the country this program of brightening electric signs has been going on. In most cases such changes have been accomplished with a following increase in attention value and without loss of other valuable sign attributes. Whole districts have become brighter with a subsequent increase in business and in general traffic.

The trend for illuminated bill-boards has been constantly towards a greater intensity of illumination on the board. It has been effected by the use of higher wattage lamps and in the use of more lighting units per board.

Just as the up-and-doing salesman has found that he can sell but that he has to hustle a lot harder to do it than ever before, the aggressive merchant finds, too, that he can sell, but that he has to coax trade a lot harder than he used to do. And when it comes to coaxing trade, light is one of the merchant's strongest allies, but it requires a time like the present to make the merchant realize how powerful a force light may be.

Very fortunately, practical developments in the use of color for window lighting have recently been carried through so that any merchant may today provide himself at small cost with lighting equipment which gives him almost complete color control of his display window. That this development is going to be a big factor in coaxing trade and that it is going to come into rapid and widespread use is a foregone conclusion.

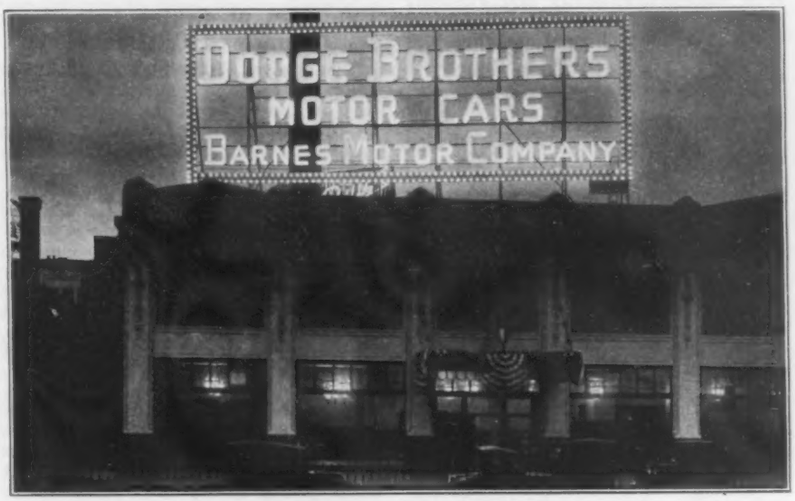
Higher intensities of illumination for store interiors are coming more and more into favor as merchants sense the value light has in bringing people into their stores and in making actual sales easier to accomplish.

Some years ago there was a general rush among retail merchants to light up the exterior of the store with 500 and 1000-watt lamps in enclosing glass globes. This means of display has been very effective in drawing interest to the store, but because it was employed by many smaller merchants who did not realize the justifiable expense of such units as entailed by four or five hours of burning each night, a considerable number of the units were not used after the first month or two.

The lighting field has of late taken a new spurt on a more sensible basis and merchants are installing such units where they are of especial advantage in putting the small and unimpressive store in the lime light or as an added means of advertising the larger and brightly lighted store.

Over in China they have a huge river which has the habit of changing its channel whenever the fit seizes it; one day the river is here but tomorrow it may move several miles away leaving a dry groove where but a few hours before was a mighty stream.

Trade has somewhat the same characteristics. The buying public is proverbially fickle and feels no obligation to any particular merchant or manufacturer, so that an effort is always necessary to keep old customers in line and to attract new ones and that is the fundamental reason why electric display advertising is valuable and tends to become more so as competition among retailers, wholesalers and manufacturers becomes sharper. It is one of the reasons for the big demand for electric display illumination right now with a big profit opportunity to the lighting industry.



A striking example of sign illumination in the automobile district of one of the larger Western cities

Activities of the West

A Business Man's Department Devoted to Events and Developments in Western Industrial Centers—Including News of Interest to Readers in Public Utility, Industrial and Trade Fields

Utilities Blamed for Floods

Suits in Colorado Courts Seek Damages For Pueblo Flood Disaster

Litigation of a far-reaching character, not only in the district affected, but to the entire West, growing out of the Pueblo flood last June, has been instituted in the courts of Colorado involving the Arkansas Railway, Light and Power Company and the Beaver Water and Irrigation Company in suits for heavy damages resulting from the bursting of dams and reservoirs at the flood period.

Suits for damages aggregating $450,000 have been filed by the irrigation company against the power company for the bursting of the Shaeffer dam on Beaver Creek. New suits have been filed by property owners against the irrigation company alleging that property damage resulting from the flood was due to the bursting of the dam and that the latter was of faulty construction and improperly cared for.

In all these cases the plaintiffs allege that the Shaeffer dam broke because it was carelessly and negligently constructed and maintained. They allege that the spillway was of insufficient size and capacity and that the discharge gates were inadequate and were not fully opened during the flood period. They further contend that the dam had settled approximately two and one-half feet near the middle, thus decreasing the capacity of the spillway. It is also alleged that the dam was defective and unsafe on account of strong seepage at its eastern end and that a large crack had been permitted to develop near its western end. Further, the defendant, it is stated, negligently and wantonly permitted the spillway of the dam to become partially clogged and thus hindered the discharge gates from being fully opened.

The suits are of major importance to power companies throughout the West, where hydroelectric resources furnish most of the power.

Freight Reductions in Northwest Aid Lumber Manufacturers

Numerous freight rate reductions asked by shippers will be put into effect by the trans-continental railroads in the near future, as the result of favorable action taken at a recent meeting of traffic managers of all lines, a report on which was made recently by the officials of the interested companies.

Of particular interest to Northwest lumber manufacturers is a decision to make a proportional rate of 61c. per 100 lbs. from north Pacific Coast points to Duluth and lumber routed by rail and water points on the Great Lakes in Michigan, Ohio, Pennsylvania and New York. The rate from Spokane to Duluth will be 58c. per 100 lbs. Another change in the lumber tariff gives the Pacific Coast shippers a rate of 75½c. per 100 lbs. to all points on the Southern Railway in Illinois. The reduction is expected to create new business. The rate from Spokane and Idaho points will be 72½c. The third change is the granting of a rate of 76c. per 100 lbs. from coast points to Gulfport, Miss., on lumber destined for export from that city. The export rate from Spokane will be 73c. A fourth change gives shooks for wire rope drums, which are now being manufactured on this coast, the regular lumber rates to eastern markets.

Idaho Mining Company Closes $750,000 Placer Deal

The largest mining deal consummated in southern Idaho for many years has just been closed at Pocatello, whereby the Gold Dredging and Power Corporation, organized by Boise people, took over 5860 acres of rich placer lands in the central Idaho section. The company also took over the equipment of the Boston and Idaho Gold Dredging Company, including their power plant on the Payette river, as well as the Centerville Mining and Milling Company's holdings on Grimes Creek, owned by W. H. Estabrook. The transfer involves property values amounting to $750,000.

The Gold Dredging and Power Corporation is capitalized at $1,500,000, and is sponsored by S. K. Atkinson, Frank E. Johnesse, W. D. Bohm, L. W. Thrailkill and E. G. Eagleson.

Extension of Crater Lake Park Disapproved By Engineers

Disapproval of the plan for including Diamond Lake and surrounding territory in the Crater Lake national park on the grounds that there are great possibilities for the development of hydroelectric power in that section is voiced in a report and resolution prepared by Oregon Technical Council and the committee of the Oregon Association of Engineers. The area in question is now under the jurisdiction of the forestry department and it seems that there is strife between two government departments for control of this section, the park bureau asking that it be set aside as a national park.

Diamond Lake is the only practicable storage site for the waters of the Umpqua river, a southern Oregon stream of unusual hydroelectric possibilities yet undeveloped, and it is claimed that if the lake were to be used as a storage basin the river would be capable of a 22,000-horsepower development.

Chicago Firm to Come West

Hurley Manufacturing Company Will Build $1,250,000 Factory on Pacific Coast

A $1,250,000 factory for the manufacture of electrical appliances will be located on the Pacific Coast by the Hurley Machine Company of Chicago, according to Edward N. Hurley, head of the company and former head of the United States Shipping Board, who recently visited San Francisco for the purpose of inspecting a site for the new industrial plant.

The Hurley company, which manufactures a popular line of washing machines, vacuum cleaners and other appliances, has recently announced a program of expansion, which included the absorption of three Chicago firms.

According to Mr. Hurley, the new factory will be located in a Pacific Coast city having direct connection with sources of raw materials as well as ample provision for foreign trade expansion. The industrial district of South San Francisco is being seriously considered as a possibility for the location of the factory.

Preliminary plans have already been prepared for the building. The plans call for a structure having at least 100,000 square ft. of floor space. It is estimated that at least 400 men and women would be employed.

This move on the part of the Hurley interests, San Francisco industrial leaders assert, is in line with the policy which has recently been established by other large eastern manufacturers who have found a large market for their products in the West. The case of the General Electric Company, which recently purchased a large site in Oakland for the location of a branch plant, is cited by them as further proof of this tendency on the part of eastern manufacturers.

The adobe electrical home in Los Angeles, one of the finest of this type of modern homes to be constructed and displayed, was recently sold for $35,000. While the home was being exhibited under the auspices of the California Electrical Cooperative Campaign and the Western Construction Company, its builders, it was visited by thousands.

The cereal food plant of the Albers Brothers Milling Company at Ogden, Utah, has been reopened after a shutdown of several months. Other grain and milling plants in the Intermountain district which have been operating on a small scale during the entire period of depression, have announced that they will immediately commence normal operation.

Events in Washington of Interest to Western Men

A Survey of Recent Developments in the Nation's Capital by Paul Wooton, Special Correspondent of the Journal of Electricity and Western Industry

Shortly after April 1 the Finance Committee of the Senate expects to complete its extensive fundamental alterations of the tariff bill and recommend its adoption to the Senate. This bill has been in the hands of the Finance Committee for more than eight months. The uncertainties which have been cast over business by this delay admittedly have had a demoralizing effect, but the members of the Senate committee have felt that it was justified because of the world-wide economic instability. The bill as passed by the House when measured by the standards of American valuations, which were set up in the bill, brought an avalanche of criticism based on the fear that the rates of duty would be unprecedentedly high. While good arguments have been advanced to show that such a fear is not justified, the Senate committee has insisted on making a very deliberate study of the effects on the tariff of such fundamental changes as the United States having become a creditor nation, the depreciation of currencies and the fall in exchange.

Many of those who would like to see the Underwood rates continue are anxious to have the uncertainty ended and are urging that final action on the tariff be taken at the earliest possible time. It is very generally recognized, however, that the consideration of the tariff bill in the Senate will be long drawn out. Legislators are dealing with conditions that are entirely new and which are not understood thoroughly. As a result there are very diverse opinions as to the action which should be taken on tariff matters.

Trade Associations

Due to the questionable practices of a few trade associations all organizations of that character have been brought under suspicion with the result that many industries are on the point of abandoning this type of activity. Commerce Secretary Hoover believes this would be a decided step backward in our industrial progress and has been doing all in his power to encourage the continuance of those trade associations that are willing to confine themselves to constructive practices. He accomplished an unprecedented thing when he secured a statement from the Attorney General outlining the things trade associations may do without fear of prosecution. It seems, however, that even this is not checking the disintegration which threatens the whole fabric of trade associations. To meet this situation, Mr. Hoover has called a conference in Washington of the representatives of trade associations. This conference is to be held April 12 for the following purposes:

1. Securing a list of trade associations that will furnish voluntarily to the Department of Commerce the classes of statistical information outlined in the correspondence between the Department of Commerce and the Department of Justice, published on February 16, 1922.

2. Discussing and considering means and methods that may be best adapted for collecting and forwarding to the Secretary of Commerce, for dissemination, the classes of statistical information outlined in the correspondence referred to, including the forms of reports that will be most suitable, for associations that are willing to furnish such statistical information.

3. Discussion of the manner in which such reports of the statistical officer of the associations are to be filed with the Department of Commerce, and the manner and method of distributing the information therein to the members of the associations and to the public.

Radio Telephone Control

Tentative recommendations as to methods and policies for radio telephone control have been made by the technical committee which was appointed at the recent public hearing at which it was admitted generally that the Government would have to regulate air rights to prevent confusion and to establish the priorities necessary to the public.

The recommendations are of great length and detail. They first point out the necessity for government control of radio telephones as the only solution to the present chaos of interference; that unless there is definite regulation of all telephone transmitting stations the whole system will be destroyed by interference.

In order to accomplish this the Committee recommends that the existing powers of the Department of Commerce should be extended to complete control of transmitting stations. It does not recommend any control of receiving stations. The Committee recommends that wave lengths below 6,000 meters should in a general way be reserved for radio telephone service but that those wave lengths which have become fixed in service for telegraph service within this range, such as SOS signals, shall be retained. But it is the hope and expectation that the radio telephone may ultimately keep the whole range from zero to 6,000 meters.

The committee considers that the present development of the art warrants the separation of 20 different wave bands within this range, of which 17 lie between zero and 2,000 meters. In the assignment of these wave bands the Committee recommends that priority first be given to broadcasting service and that secondarily, broadcasting service itself should be divided into priorities in the following rotation, first Government broadcasting; second, educational and public broadcasting; third, private broadcasting including entertainment, news, etc., and fourth, toll broadcasting.

Reservation of wave lengths between 150 and 275 is made for amateurs and some opportunity in experimental wave lengths would be assigned to them in addition.

The Conference strongly recommends the extension of authority of the Government into thorough control of transmitting stations and that the radio telephone may be considered a public utility.

Freight Rates to Come Down

The concensus of opinion among traffic men in Washington is that the Interstate Commerce Commission in its forthcoming decision, in the freight rate reduction case, will authorize general reductions amounting to not less than ten per cent and reductions on basis commodities of from fifteen to twenty per cent. It is believed that the evidence submitted to the Commission establishes beyond question that reductions to that extent can be made without reducing the revenues of the carriers. In fact, there is a very widely held opinion that the reductions will result in increased revenues as the result of the stimulus of cheaper rates.

Highway Legislation

Hearings began March 15 before the Committee on Roads of the House of Representatives at which consideration was being given to the expenditures which the Federal Government is justified in making in aiding highway construction. Apparently a majority of the committee favors the Woodruff bill which carries an appropriation of $50,000,000 for the next fiscal year; $65,000,000 for the fiscal year to end June 30, 1924, and $75,000,000 for the fiscal year to end June 30, 1925. The American Association of State Highway Officials is contending for an appropriation of not less than $75,000,000 for each of the next three fiscal years.

Manufacturers of U. S. Motors Report Increasing Business

The U. S. Electrical Manufacturing Company of Los Angeles, motor manufacturers, report that their business for 1922 thus far shows a decided increase over the corresponding period of last year. Business booked for the month of February shows orders equal to 200 per cent of those for February, 1921, making the month of February, 1922, the largest month's business in the history of the company. This company began the manufacture of motors thirteen years ago on the Pacific Coast, and has specialized in this line of manufacture during the entire time.

In order to take care of the rapidly increasing growth of their business, it is reported that the company is planning the construction of and expects to be in a new factory the latter part of the present year. The new factory will take care of the largely increased demand, and be of the most modern construction.

In order to secure the advantage of the latest type construction in factory buildings, the owners of the business, H. G. Steel, president, and C. E. Johnson, vice-president, are going to spend thirty days on an eastern trip, studying various types of factory construction. They expect to leave for the East during the month of May.

California Cities Contribute to Boulder Canyon Survey

The United States Reclamation Service has been making engineering investigations of the Boulder Canyon damsite on the Colorado River. The funds for this purpose are now exhausted and the cities of Pasadena, Long Beach, and Los Angeles are proposing to appropriate funds for the purpose of assisting the engineers in continuing this investigation until other money is available. As a result of recommendations made by City Manager Koiner of Pasadena, the Board of Directors of that city have appropriated $5,000 toward such a fund. It is said that Long Beach and Los Angeles have signified their intention of also appropriating similar amounts for the same purpose. The statement is made that this money is in the nature of a loan and will be repaid from Congressional appropriations.

The Seimens-Shuckert Company, a German syndicate, is reported to have completed a contract with the Chilean government for the erection of eleven radio stations in Chile. The proposed stations would range from two to five kilowatts in capacity and would cost approximately $500,000. They would be of the Telefunken continuous wave type rather than the Marconi type.

Commission Seeks Solution of Colorado Problem

Many Arguments Presented at Meetings Held in Phoenix and Los Angeles in Effort to Expedite Development of River

The immediate construction of the Boulder Canyon dam for the protection from floods of the irrigated lands in Arizona and the Imperial valley, with the added clause that the seven states comprising the Colorado basin enter into a twenty-year litigation holiday with water rights remaining as they are at the present time, is the outstanding suggestion brought forward during the sessions of the Colorado River Commission which have been held in Phoenix and Los Angeles.

Meanwhile Secretary of Commerce Hoover and the members of the commission have visited and inspected the site of the proposed dam which various groups have recommended that the government construct, and have visited the Imperial Valley for the purpose of determining how pressing the flood menace is at the present time.

Speakers from all of the districts which will be affected by the development of the river have agreed that irrigation interests should supersede power plans while many have contended that flood control should take preference over both of the above.

The meetings are being held primarily for the purpose of working out a feasible plan for the development of the river before making a report to Congress. Hearings in each of the sections affected are being held so that the commission might have the benefit of suggestions or criticisms from individuals or organizations interested in the development of the river.

So far no definite agreement has been reached owing to the wide divergence of opinion over the matter of states rights, each of the many states claiming to have prior rights to the use of the water. Wyoming, Utah and Colorado form one group which is contending that Arizona and California, if given the opportunity, would prevent any use of the water in the northernmost states of the basin. Arizona, Utah and New Mexico are seeking water for power and irrigation development, while California is asking primarily for flood control.

Speakers from Southern California proposed to the members that California would forego all claims to water rights provided immediate and ample flood control was assured for the Imperial Valley.

One of the most reasonable solutions for the entire problem, certain members of the commission contend, is that offered by John Hoyt, hydraulic engineer in charge of the distribution of surface waters for the U. S. Geological Survey, who presented an analysis of the situation from the point of view of a disinterested government bureau.

A study, he said, indicates that three distinct problems must be considered—one relating to irrigation in Colorado, Wyoming and Utah, where the headwater tributaries of the Colorado contribute more than 90 per cent of the total flow; another relating to power and irrigation in New Mexico, Arizona and Nevada, and a third relating to irrigation in California.

He asserted that it is the belief that all interests will be fully protected by an agreement that at least 65 per cent of the present flow of the river shall reach the canyon section and that no rights for power or irrigation shall be created in or below the canyon that will deprive the states of Colorado, Wyoming and Utah of a right to consume 35 per cent of the present flow above the canyon. He added that this allotment should apply for fifty years.

Mr. Hoyt's statement showing the physical and other conditions bearing on the problem of utilizing the water of the Colorado River as follows:

The following table shows the distribution of the drainage area among the seven states and Mexico and the average annual contribution from each to the total flow of the stream.

State	Drainage Area Sq. mi.	Pct.	Flow Acre-feet	Pct.
Wyoming	18,000	7.2	2,300,000	12.5
Colorado	39,000	15.5	11,800,000	64.1
Utah	40,000	15.9	2,300,000	12.5
New Mexico	23,000	9.2	1,260,000	6.8
Arizona	113,000	45.0	740,000	4.0
Nevada	12,000	4.8	Negligible	
California	4,000	1.6	Negligible	
Mexico	2,000	.8	Negligible	

As the Journal of Electricity and Western Industry goes to press, Secretary Hoover and his commission are holding hearings in Salt Lake City and Denver for the purpose of gathering further expressions of opinion regarding the recommendation which the commission shall make to Congress. Reports of these meetings will appear in the next issue of this publication.

Van Camp Packing Co. Purchases California Canneries

The Van Camp Packing Company, one of the largest packers of food products in America, has completed negotiations for the acquisition of four canning plants in California, according to an announcement made by W. B. Campbell, president of the firm, following a visit to San Francisco.

In entering the California canning field, the company will purchase outright plants in San Francisco, San Jose, and Reedley and will lease a fourth plant at Oroville. It is understood that $4,000,000 was required to finance these deals.

During the fruit season, the Van Camp interests will pack peaches, pears, cherries and other fruits, and between seasons will pack other standard Van Camp products, of which there are more than fifty.

The decision to enter California was brought about by the desire to add canned fruit to the present line of Van Camp products as well as to make a saving by supplying Pacific Coast and export markets with the other Van Camp products direct from packing plants on this coast instead of paying the high freight rates from eastern centers.

Plans for enlarging the plant of the Tamal Packing Company in San Francisco to four times its present capacity have already been announced. Officials of the company declare that $1,000,000 will be spent remodeling and equipping this plant for the 1922 fruit season.

Report Progress on Skagit River Power House Plans

Plans for the concrete and steel Skagit River power house to be built as a part of the Skagit River power development project by the city of Seattle are progressing rapidly in the offices of Hydroelectric Engineer C. F. Uhden in the Alaska Building. Construction work will be started about June 1, it is believed.

Specifications call for a building 160 by 90 ft. in size, and 112 ft. in height, with three floors. It is hoped to complete construction work to permit of machinery being installed before the end of the present year. Two huge generators, with their water wheels are to be installed this year, and another generator at a later date. In addition, six transformers will be housed in the new power house, and around the generators a craneway to accommodate a 150-ton electric traveling crane with a clear span of 45 feet is to be erected.

Plans, specifications and proposals for contractors for switchboard equipment for this plant were recently approved by the Board of Public Works, and bids for the switchboard, switchboard instruments and switches, will be opened on April 14 by the Board of Public Works.

Mountain States Power Co. Buys Oregon Utility Properties

It is reported that the Mountain States Power Company has purchased the properties of the Cottage Grove (Ore.) Electric Company from the owners, C. M. Shinn and O. M. Kem. It is the plan of the new owners to operate the steam plant at Cottage Grove until such time as an 11,000-volt line can be constructed to connect with the company's plant at Springfield which will be the terminus of the 110,000-volt line being built by the California Oregon Power Company. The Cottage Grove plant has been in operation for 12 years and has a large patronage. The Mountain States Company believes that the business can be developed and that many of the sawmills and planing mills in that district will use electric power in the future.

L. A. McArthur, general manager of the Pacific Power and Light Company, of Portland, Oregon, in a recent interview with a representative of the Journal of Electricity and Western Industry in San Francisco, stated that his company since January 16th has disposed of 701 shares of their 7% preferred stock. The campaign is now under way in which 28 different employe teams have been organized. The campaign will end in April and prizes will at that time be awarded to those who have put over the most effective service in sales of stock.

An interruption to electric service from an unusual cause recently occurred in Hood River, Ore. Beavers busily engaged in laying out their homestead very carelessly felled a tree through one of the transmission lines of the Pacific Power and Light Company, throwing the Parkdale district out of service for one night and causing a disturbance to service in Hood River.

Government Installs Electric Ovens at San Diego Base

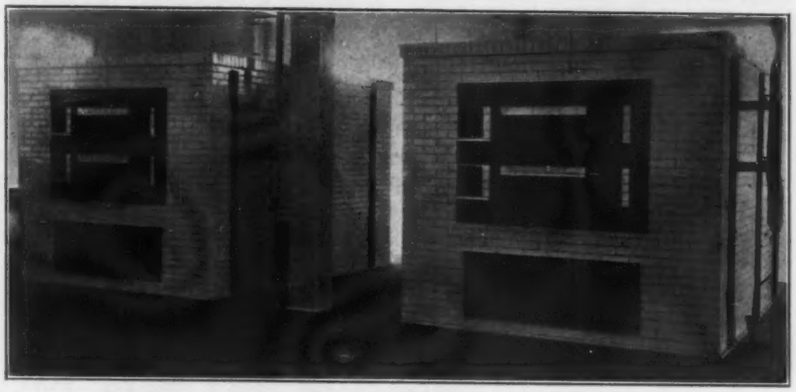
The experience of the Government with electric cooking equipment on board battle ships has been so satisfactory that electric bake ovens were selected as the baking equipment for the three million dollar home of the U. S. Marines at San Diego.

The new base is situated on a tidelands site, donated to the Government by the city. The present buildings are of sufficient capacity to house one thousand men. This base is thoroughly equipped and up-to-date in every respect.

The baking for all the men is done at a model bakery having a capacity of 1200 loaves per day. Flour is dumped into a giant hopper where it is sifted to remove any possible foreign matter that it might contain. The flour then passes to the mixer where it is automatically weighed, measured, mixed and heated to the required temperature. After the dough has raised for about six hours, it is cut to the required size, kneaded and dumped into the pans by machines.

This bakery is equipped with two electric ovens, each having a capacity of 240 one-pound loaves of bread, and consuming a maximum of 35 kilowatts. The ovens are of the stationary type, built of brick under the supervision of the manufacturer. They are equipped with steam connections and mercurial thermometers, so that the temperature can be accurately gaged and the heating elements are above and below each deck. The whole shelf is used efficiently by means of the wide doors and the three-heat control switches enable the operator to control perfectly the baking temperature. The appearance of the glazed white brick of the oven exterior is in keeping with the quality of the product of the oven. As there is no combustion, flame, fumes or soot, this type of equipment is indeed ideal for the model bakery.

The Marine Base ovens, together with the one recently placed in commission at Camp Kearny, make a total of 23 ovens served by the San Diego Consolidated Gas and Electric Company. Many of these ovens have superseded others using various kinds of fuel. It has been found that the many advantages incident to the use of electricity for fuel make them very satisfactory. The cost of electricity per heat unit is greater even when a special rate is offered, than most of the competing fuels. It has been found, however, that the efficiency of utilization of the electric oven is greater, due to the accuracy of control and the heavy heat insulation. The result is that the cost of operation of the electric ovens compares favorably with other types of fuels for other than bread baking.



Two 35-kw. electric bake ovens which have been installed in the three million dollar Marine base at San Diego by the government. The San Diego Consolidated Gas and Electric Company has 23 such ovens on its lines at the present time, showing that the popularity of this type of equipment is constantly increasing.

Approval of Columbia Basin Plans Expected From Goethals

The feasibility of the Columbia River basin irrigation project, it is believed by those in touch with the situation in the Northwest, will be affirmed by General George W. Goethals when he makes his final report on the results of the investigation which he has just concluded. His report when compiled a few weeks hence will be made to Dan A. Scott, state director of reclamation. To members of the Tacoma Commercial Club, who sat with him at a dinner given in his honor recently, he painted a word picture of the vast area within the limits of the project at that future time when it will have been brought under water, and when he envisioned the entire district happily populated and the whole area blooming and fertile under the touch of water, he left no doubt of his belief that the thing can be done.

Applications have been filed with the public service commission of Wyoming for the construction of a pipe line from Carbon county, Wyoming, to Denver, for the purpose of supplying the latter city with natural gas from the Mahoney Dome oil fields. The plan of bringing natural gas to Denver was proposed last December and since that time negotiations have been in progress for perfecting the scheme.

A three-sided controversy over the use of the waters of the Truckee River has developed between the state of Nevada, the United States Reclamation Service and the Nevada Valleys Power Company. The reclamation service has refused to proceed with the Newlands irrigation project unless the state revokes the power rights granted to the power company by the state in 1911. The power company is contemplating the erection of a plant on the site at Vista, Nevada.

$3,500,000 Equipment Contracts Let By California Utility

Contracts totaling approximately $3,500,000 have just been let by the Southern California Edison Company covering complete generating equipment and auxiliary apparatus for a 75,000-kw. hydroelectric station, an additional 16,000-kw. generator in a present hydroelectric station, and miscellaneous apparatus for several substations and for converting the present 150,000-volt Big Creek lines to 220,000 volts.

This apparatus is to be used in a new station, Big Creek No. 3, in Big Creek No. 1, in stations on the Big Creek transmission lines and in terminal substations on these lines. For Big Creek No. 3 three 25,000-kw. generators have been purchased which will be driven by single 35,000-hp., 935-ft. head reaction turbines. The generators will operate at 10,000 volts and will be connected to the 220,000-volt transmission lines through seven 18,500-kva. transformers. Three welded penstocks 1375 ft. long ranging in diameter from 7 ft. to 6 ft. will be installed. In Big Creek No. 1 an additional 16,000-kw. generator will be installed driven by a double overhung impulse wheel rated at 22,500 hp. An additional penstock 4370 ft. long ranging in size from 42 in. to 26 in. in diameter will be installed at this station. For Big Creek No. 1 and No. 2 and for a substation on the Big Creek transmission line there have been ordered eighteen 17,500-kva. auto-transformers for 150,000 to 220,000-volt service. For installation at Eagle Rock terminal substation on the Big Creek lines there have been ordered six 36,700-kva. auto-transformers for the same voltage. This apparatus, together with thirty-two 220,000-volt oil switches rated at 3500 arc-amperes, will be used in converting the present 150,000-volt double circuit Big Creek transmission lines to 220,000-volt operation.

An additional terminal substation for the Big Creek lines will be constructed and part of the apparatus for it was included in these contracts. Included are a 30,000-kva. synchronous condenser, seven 20,000-kva., 220,000 to 60,000-volt transformers, and four 10,000-kva., 60,000 to 6600-volt transformers. This station will be partly constructed this year and completed next year.

The first two units in Big Creek No. 3 and the additional unit in Big Creek No. 1 will be placed in operation in the spring of 1923 at which time it is planned to have the Big Creek transmission lines converted and reinsulated for operation at 220,000 volts. The third unit in Big Creek No. 3 will be placed in operation early in 1924 and will complete this station to one-half its ultimate capacity.

The impulse wheel in Big Creek No. 1 will be supplied by the Allis-Chalmers Company; the reaction turbines in Big Creek No. 3 by the Wellman-Seaver-Morgan Company; the penstocks by the Kellogg Company; the electrical equipment for Big Creek No. 3 by the Westinghouse Electric and Manufacturing Company; and the other equipment ordered will be supplied by the General Electric Company.

Will Illuminate 12-Mile Highway in Southern California

Recognizing the commercial, safety and esthetic values of good boulevard lighting the citizens of Santa Monica, Sawtelle, Beverly Hills, Los Angeles, and the residents of the country between these cities are uniting in a plan for the installation of ornamental standards on Santa Monica Boulevard from end to end, a distance of 12 miles.

It is proposed to have the entire installation uniform in design, expense to be borne by the different sections traversed by the drive. Many accidents have occurred during the 10 months' period each year when pleasure traffic frequently reaches the enormous total of 16,000 to 18,000 vehicles between the hours of 8 a.m. and 11 p.m. daily. Inasmuch as the boulevard follows residence territory throughout its entire length it is anticipated that all interests will agree to the installation of the latest and most approved form of boulevard lighting units.

Yosemite Valley Has Wireless Communication System

Successful operation of wireless telegraph and telephone stations in Yosemite Valley, California, has been accomplished. After several weeks of experiment, results are so satisfactory that announcement was recently authorized that wireless henceforth will be a permanent method of communication with the popular resort, though it may not be open for commercial use until next winter.

Edwin J. Symmes, of Alameda, architect for a hotel company operating in Yosemite National Park, put in the first wireless set for his own amusement and has received messages from several score damped and undamped wave stations, including Honolulu and Catalina Island. Government authorities also have put in a station, which will be used to keep in touch with the outside world when state-wide storms interfere with wire communication and in touch with Glacier Point, now open to visitors throughout the year, which is 3254 feet sheer above Yosemite Valley.

Because Yosemite Valley is literally a "hole in the ground" several wireless experts declared local conditions were entirely against successful operation of a wireless station there. Yosemite's granite cliffs rise straight into the air for 3,000, 4,000 and 5,000 feet. Nevertheless, the Valley folk have been getting news reports, weather predictions, market quotations, and good music right out of the air, with no other aerial than wires strung between two of the giant trees with which the valley floor is forested.

The Tokyo Underground Railway in the Japanese capital is preparing to begin excavations on a ten-mile subway through the heart of the city. The system will cost approximately 35,000,000 yen or $17,500,000.

Pupils of the Myrtle Hill School in Denver have perfected a pageant showing the evolution of lighting from the time of the cave man to the present day electric bulb. The pageant is being shown before various school organizations as well as civic and commercial clubs.

Company Secures Terminal For Its Electric Ferries at S. F.

Final arrangements have been made between the Golden Gate Ferry Company and the State Harbor Commission for exclusive use of terminal facilities at the foot of Hyde street in San Francisco, where the company will have available 50,000 square feet in which to handle passengers on its electrically operated boats.

This site was chosen after failure to reach an agreement with the Pacific Gas and Electric Company. Three car lines—Hyde street, Stockton street Municipal and Larkin street—reach the close proximity of the terminal. The three blocks to Van Ness avenue are paved, three streets to the water front near the ferry are paved and Columbus avenue is being widened and paved through to Hyde street.

At the Alameda shipyards of James Robertson, work is being rushed on the first boat of the company. The engines are being built in Oakland and the motors in New York. Work will begin soon on the terminals and it is the intention of the directors to have the boat running in June.

Oregon Irrigation Congress to Enter Colonization Field

Plans are now under way to engage the Oregon Irrigation Congress more actively in development work of the state, according to announcement of Portland men in attendance at the eleventh annual irrigation congress held in Pendleton recently. Through a paid secretary with offices in Portland the organization will undertake colonization work on assured projects. This is a step deemed as vital as actually turning the water upon the land.

The irrigation congress cooperating with the Oregon state chamber of commerce, will begin to work out some plan to aid in attracting settlers either from the East or from the better developed sections of Oregon to the irrigated lands. An effort will be made to provide sums on easy terms that will enable settlers to make a start in the various districts. The congress endorsed the McNary-Smith bill now pending before congress, and the funds which it will provide will assure progress in putting through Oregon irrigation work.

Electrical men of Chehalis and Centralia on January 25 were hosts to lumbermen, architects, building contractors and realty dealers in those cities, at a banquet held in the St. Helens Hotel, Chehalis. The principal speaker of the evening was Stephen I. Miller, Jr., Seattle, secretary-manager of the Northwest Electrical Service League.

The properties of the Universal Electric and Gas Company of San Francisco, recently purchased by the Great Western Power Company, will be operated jointly by the latter utility and the Pacific Gas and Electric Company, subject to the approval of the State Railroad Commission, according to an announcement recently made by John A. Britton, vice-president and general manager of the Pacific Gas and Electric Company. Each of the larger power companies will operate that portion of the Universal's holdings that is within their respective service territories.

Books and Bulletins

Switching Equipment for Power Control

By STEPHEN Q. HAYES, A.B., E.E., switchboard engineer, Westinghouse Electric and Manufacturing Company. 9¼ by 6½ inches. 463 pages. 274 charts, diagrams and illustrations. McGraw-Hill Book Company, Inc., New York.

Switching equipment for power control has aptly been called the "brains" of the plant whose duty it is to produce or distribute electrical energy, in that it performs all of the duties of direction and control that are so vital to the proper functioning of the entire system.

This book constitutes the first American volume strictly devoted to this subject. The book contains information regarding standard practice as it exists today rather than special application of the subject. It ably fulfils its primary purpose, namely, that it furnish the actual switchboard operator with information that will aid him to keep the equipment in his care in the best operating condition, by explaining what should be expected of the apparatus.

The book should prove helpful to the student in electrical engineering in giving him a better understanding of the art. Consulting engineers and others will find enough information in the discussion of the theoretical features to give them an understanding of the functions and limitations of the various devices.

"Export Helps" is the title of a booklet just issued by the industrial machinery division of the bureau of foreign and domestic commerce, which describes the new service to machinery manufacturers and exporters which has recently been instituted by the Department of Commerce. The aims of the new division, the services which it offers and other interesting facts are set down in the booklet.

The Bates Steel Pole Treatise for 1921 has just been issued by the Bates Expanded Steel Truss Company of Chicago. The book is one of the most comprehensive yet to be issued on this subject, and is remarkably well illustrated. In addition to containing a full description of the Bates products, it devotes almost one hundred pages to facts pertaining to pole line engineering and economics with many valuable tables and charts.

To sell the idea of more time for the enjoyable things of life is the primary object of a most attractive and unusual little booklet which The Society for Electrical Development is ready to distribute. "More Leisure Hours" is the title, and in 24 entertainingly written and illustrated pages the booklet tells how hours of drudgery may be eliminated by the use of electric service and appliances.

Each page points out the service of one appliance as an aid to better and more economical living. While no too-obvious attempt is made to sell, few readers of the booklet can escape the desire to buy and use more electrical aids.

Meetings of Interest to Western Men

Vancouver Electrical Men Hear Lawrence W. Davis Speak

Electrical men of Vancouver, B. C., on March 2 were addressed at a dinner in the Hotel Vancouver by Lawrence W. Davis, of the National Association of Electrical Contractors and Dealers, and by M. K. Pike, general sales manager of the Northern Electric Company of Montreal. A hundred were present in spite of the epidemic of influenza. The gathering was held under the auspices of the Electrical Service League of British Columbia and the Vancouver Association of Electrical Contractors and Dealers, W. G. Murrin, assistant general manager of the B. C. Electric Railway Company being in the chair.

Mr. Davis, besides dealing at length with contractors' and dealers' problems, praised the work of the league, saying that the local men had in the league what was aimed at in the East.

Mr. Pike told of the progress of the electrical home idea in eastern Canada, such as in Toronto, Montreal and Hamilton. At the luncheon of the Vancouver Electric Club on March 3, Mr. Pike was a speaker on the same subject. He was accompanied on his western trip by Mr. Carswell, chief accountant of the Northern Electric Company.

Montana Contractor-Dealers Hold Annual Convention at Butte

Butte has been chosen for the next meeting place of the Montana Association of Electrical Contractors and Dealers, who in annual convention in that city on March 6 and 7, held one of the most widely attended and successful sessions in the history of the organizatian. Sixty members of the electrical industry as well as many visitors from outside the state attended the meetings.

The first day of the convention was given over to a summary of progress for the past year delivered by James H. Mills of Great Falls, the retiring president, and to routine business. The evening was devoted to a smoker held in the rooms of the Empeco Club.

The important feature of the convention was the program given on March 6, an outline of which follows:

"General Labor Conditions and the Outlook for 1922" by George I. Martin, secretary of the Montana State Associated Industries.

"Inspection and Materials" by J. Meriam, representative of the Underwriterss Association.

"Your Problems of Wiring and Merchandising" by H. D. Sanborn, General Electric Company, Chicago.

Address by Lawrence W. Davis, special representative, National Association of Electrical Contractors and Dealers.

"The Business Outlook for 1922 by Stephen I. Miller, Jr., secretary-manager of the Northwest Electrical Service League.

The following officers were elected by the convention for the ensuing year:

President — Ernest Shelley of the Electrical Supply Company of Livingston.

Vice-president—Joseph Olson of the Electric Shop, Great Falls.

Secretary and treasurer — Emanuel Downing of the Independent Electric Company, Butte.

Directors — James H. Mills, Great Falls Electric Supply Company; Leroy N. Baker, Electric Shop, Missoula,; O. C. Langstadt, Arnold Electric Company, Butte; Joseph Elves, Miles City Electric Company.

Northwest Jobber Salesmen Hold Meetings in Seattle

Under the auspices of the Northwest Electrical Service League a meeting of Seattle electrical jobber's salesmen was held in the L. C. Smith Building Restaurant, Saturday, March 4th. Thirty salesmen were present.

Professor W. D. Moriarty of the College of Business Administration of the University of Washington brought out, in a new and effective way, the principles and functions of window trimming. Pictures of four window displays which had been decorated for the purpose were distributed to the salesmen, who in turn will use them in their work with the contractor-dealers. Professor Moriarty discussed the function of window trimming as illustrated by the pictures. The principles of unity, simplicity, balance, grouping, harmony and action were illustrated and emphasized. Professor Moriarty emphasized the fact that a window is used to announce the store; that it should have, if possible, some heart interest; that what goes into the window depends upon the class and attitude of people that pass, whether they are in a hurry or have time for window shopping. He said that most windows had too many things in them and that the average person could only think of three things at a time.

COMING EVENTS

NORTHWEST ELECTRIC LIGHT AND POWER ASSOCIATION
Annual Convention—Boise—June 7-10, 1922

PACIFIC COAST ELECTRICAL ASSOCIATION, AFFILIATED WITH N. E. L. A.
Annual Meeting—Los Angeles, May 31-June 2, 1922

AMERICAN ELECTROCHEMICAL SOCIETY
Spring Meeting—Baltimore—April 27-29, 1922

California Electrical Safety Orders Near Completion

The revision of the Electrical Utilization Safety Orders of the California Industrial Accident Commission is nearing completion. The work has been in the hands of a well qualified committee for over two years. The result of their work is a tentative draft which is a combination of the present Electrical Utilization Safety Orders and the National Electrical Code, with modifications and interpretations of both, combined with the addition of several new sections which have not previously been covered by either.

The preliminary draft when printed is to be distributed to persons interested in reviewing the work. Suggestions that may be offered for changes in these orders, which would be consistent with safe practice and in conformity with existing standards for electrical construction, will be appreciated by the committee. Such suggestions should be mailed to the Industrial Accident Commission and, if possible, each should be submitted in the form of a substitute for the order in question, so that it may be considered by the committee as such.

The publication of this preliminary draft will make no change in the plan of later printing the orders in tentative form for further distribution and review before the advertised public hearings are held, after which the revision will be printed in final form. Not more than thirty days will be allowed for reviewing the work and returning the criticisms to the committee. The Industrial Accident Commission has ordered no additional copies of the 1916 Electrical Utilization Safety Orders and there is an urgent demand for the revised edition. Only a limited number of copies will be printed and applications will be filled in the order that they are received. Requests for the preliminary orders should be addressed to the Department of Safety, Industrial Accident Commission, 525 Market St., San Francisco.

Electric heating is popular in the Far North, according to word received from W. T. Stuart, manager of the Prince William Sound Water-Power, Light and Telephone Company, Valdez, Alaska. According to Mr. Stuart, the Seattle Hotel, which was recently completely electrified by his company, has the distinction of being the largest building in the Far North to be entirely heated by electricity. The company charges a flat rate of $7 per month for a 2.5-kw. heater, giving twenty-four hour service. The Valdez Hospital has also been completely electrified.

The second conference on the business training of the engineer and the engineering training of the student of business has been set for May 1 and 2 at the Carnegie Institute of Technology, Pittsburgh, by the United States Commissioner of Education.

Plans for an intensive campaign for education in industrial and domestic electric heating have been instituted in Japan by the Osaka Electric Light Company. The first step in the program has been the cutting of the power rates to 3 cents per kw-hr.

Personals

Frank Waterhouse, recently elected president of the Seattle Chamber of Commerce, is known as one of the leading and most public spirited business leaders in Washington's metropolis. He came to Seattle in 1898 and established himself in the shipping business, but his interests have been broad and he has organized and operated other business and commercial enterprises. Public service has animated Mr. Waterhouse's career. His war work has been

FRANK WATERHOUSE

characterized as extraordinary and in recognition of his activities in this field he was chosen president of the Seattle Chapter of the Red Cross, a position he still holds. He was one of the organizers and former president of the Associated Industries of Seattle, the organization which established the American plan in that city in 1919 following a series of labor difficulties. As a shipping man, he was a pioneer in the establishment of certain Alaska routes, in opening up the Seattle-Siberia trade and in certain Oriental enterprises.

H. A. Rutherford, Seattle, has been appointed superintendent of State Parks of Washington, with offices in the state highway department in Olympia. The work of the superintendent of parks will be largely educational.

George W. Bixler of the Denver Gas and Electric Light Company, representing the Rocky Mountain Committee on Public Utility Information and the Denver Electrical Cooperative League, addressed the Lions' Club meeting at Boulder, Colorado, March 8th, as one of the Electrical Week features in that city.

H. L. McGovern has been made a partner in the Cahn-Forster Electrical Company of Denver.

J. C. Davidson, manager of the electrical department of Hendrie and Bolthoff, one of the large Denver jobbers, is touring the East in the search of "new ideas."

Frederick H. Reid, general manager of the Mountain States Telephone and Telegraph Company with headquarters in Denver, has been elected vice-president of the Southern Bell Telephone Company and will shortly leave for Atlanta, Ga.

George R. Randall, manager of the Salt Lake Electric Supply Company of Salt Lake City, is a recent San Francisco visitor, having come to the coast for the purpose of studying business conditions in this section.

Josiah E. Spurr, editor of the Engineering and Mining Journal-Press, the consolidated mining paper representing the best elements of the Engineering and Mining Journal of New York and the Mining and Scientific Press of San Francisco, has been a recent San Francisco visitor in the perfecting of the new consolidation. After a ten days' visit in the West, he has returned again to New York City. **T. A. Rickard,** formerly editor of the Mining and Scientific Press, will be contributing editor for the Journal-Press with headquarters in San Francisco.

Dr. T. A. Addison, Pacific Coast manager of the General Electric Company, has recently returned to his office in San Francisco after an extensive tour of the world. Dr. Addison left New York City last October, visiting Italy, Egypt, India, China and Japan. Dr. Addison is one of the pioneers in the electrical industry on the Pacific Coast, having come to San Francisco in 1890 to take charge of the western branch of the Thompson-Houston Company which later amalgamated with the General Electric Company. He has been Pacific Coast manager of the latter company for more than thirty years.

F. K. Zook, valuation engineer for the Northwestern Pacific Railroad Company, has retired from his position after fifty-one years of successful railroad service.

R. A. Balzari, manager of the industrial division of the San Francisco office of the Westinghouse Electric and Manufacturing Company, has been elected president of the San Francisco Electrical Development League for the coming year. Mr. Balzari is a graduate of the University of California. He began his career in the electrical industry with the Pacific Gas and Electric Company and entered the San Francisco office of

R. A. BALZARI

the Westinghouse company in 1908. Mr. Balzari has been very active in the affairs of the Pacific Coast Geographic Division of the N. E. L. A., now the Pacific Coast Electrical Association, having served as chairman of the membership committee. Previous to his election to the presidency of the Electrical Development League, he was one of the most active members of this organization.

Walter C. Wurfel, president and sales manager of the Electric Supplies Distributing Company of San Diego, has been elected president of the San Diego Electric Club for the coming year. Mr. Wurfel began his career in the electrical industry at the age of 19 with the Jenney Electric and Manufacturing Company, Indianapolis. Later he came to Denver and was associated with the Mountain Electric Company. Subsequently he served as power apparatus

W. C. WURFEL

salesman with the Western Electric Company at the Denver branch, later going to Salt Lake City, where he served this company and later the Intermountain Electric Company. He joined the Westinghouse Electric and Manufacturing Company in Denver. In 1915 he was appointed Pacific Coast manager of the Westinghouse Lamp Company. He purchased the controlling interest in the San Diego jobbing firm which he now heads in 1920. In addition to being one of the most active members of the Electric Club, he is prominent in the affairs of the Rotary Club as well as other civic and commercial organizations.

Raymond Alvord, manager of the local supply department of the General Electric Company in San Francisco, is receiving many congratulations on the excellent salesmanship study course that is being conducted for retail electrical merchants in that city under the auspices of the California Electrical Cooperative Campaign. Those who have had a substantial part in the forwarding of this work among contractor-dealers are H. H. Miller, Pasadena, California; H. H. Courtright, Fresno, California; Louis Levy, San Francisco, California, and James Wood, Sacramento, California.

James Hamilton Mills, president of the Montana Association of Electrical Contractors and Dealers with headquarters at Great Falls, Montana, has spent the major portion of the last bi-weekly period in Butte, Montana, where he has conducted a very successful annual meeting of the State Association.

C. E. Grunsky and **W. L. Huber,** two prominent consulting engineers of San Francisco, are largely responsible for the bringing of the national convention of the American Society of Civil Engineers to the Pacific Coast in October, when a meeting devoted to water power development will be held in San Francisco.

William C. Sterne, who was elected chairman of the Rocky Mountain Committee on Public Utility Information to succeed T. O. Kennedy, has had a varied industrial career along with his engagement in the public utility business. After graduating from Harvard University in 1891, he went to Europe in the interest of a fertilizer company and in 1895 he moved to Colorado where he engaged in the drug and chemical manufacturing business. He then transferred his attention to the banking and lumber business. In 1905 he started a central station which is now known as the Summit County (Colo.) Power Company, and with the Municipal Properties Investing Company he assumed control of the Arvada (Colo.) Electric Company, the Arapahoe County (Colo.) Electric Light and Power Company, the McCook (Nebr.) Electric Company, and the Fort Lupton (Colo.) Light and Power Co. In addition to these interests, he is president of the Littleton (Colo.) Lumber Company and is a director of the Hamilton National Bank of Denver. "Bill," as he is generally known, is considered one of the Doherty organization's most progressive executives.

W. C. STERNE

C. W. Stone, manager of the lighting department of the General Electric Company, together with **F. H. Babcock** and **G. F. Brown,** members of the same department, are recent visitors at the Pacific Coast headquarters of the General Electric Company at San Francisco. The trio of lighting experts are touring the West.

William McClellan, president of the American Institute of Electrical Engineers, has opened offices for the general practice of engineering and construction in New York City, in conjunction with Peter Junkersfeld and Horace T. Campion.

Edwin M. Herr, president of the Westinghouse Electric and Manufacturing Company, recently spent several days in Denver, his boyhood home. Mr. Herr began his career in the electrical industry in that city in 1878 as a telegraph operator. He later went to Yale, and joined the Westinghouse company upon graduation.

Joseph Jacobs, consulting engineer of Seattle, has been named consulting expert for the greater Wenatchee and Quincy irrigation projects in Washington.

Samuel H. Taylor, secretary of the Pacific Coast Electrical Association affiliated with the N. E. L. A., has retired from the presidency of the Electric Railway and Manufacturers' Supply Company of San Francisco and will devote all of his interest to the Safety Electric Company, which he owns. On March 21 Mr. Taylor celebrated the thirty-eighth anniversary of his entrance into the electrical industry in California. In 1898 he organized the company from which he has just resigned and of which he became president in 1906. He will be succeeded in the presidency by **W. H. Whiteside,** Pacific Coast adviser to the Westinghouse Electric and Manufacturing Company.

Lee H. Newbert, manager of the East Bay division of the Pacific Gas and Electric Company, has been elected to membership on the board of directors of the Oakland Chamber of Commerce.

Clyde C. Kennedy, consulting engineer of San Francisco, has announced a change of office location from the Holbrook Building to 626-628 New Call Building.

A. W. Copley, general engineer for the Westinghouse Electric and Manufacturing Company, delivered an interesting lecture before the San Francisoc section of the A. I. E. E. on March 24 on the subject of "Engineering Short Cuts as Applied to Power Circuit Studies." A man of broad experience in the study and practice of power systems, Mr. Copley presented a highly instructive address.

Charles H. Talmage, for the past six months field secretary of the Rocky Mountain Electrical Cooperative League of Salt Lake City, has resigned from that position to become manager of the Omaha branch of the Western Electric Company. Mr. Talmage has been associated with the electrical industry for more than twenty years, having joined the Western Electric Company in 1901. Before taking over the Salt Lake City office of the company in 1917, he was branch manager at Kansas City. During the five years he has spent in the Intermountain district he has been one of the most active members of the electrical industry. He was instrumental in the formation of the Rocky Mountain Electrical Cooperative League and served on its advisory committee from the time of the league's organization until his appointment as secretary. He will be keenly missed by his associates in that section of the West.

C. H. TALMAGE

John D. Scott, commercial engineer of the Portland Railway, Light and Power Company, is the new chairman of the Portland section of the National Electric Light Association, and is doing much to make the meetings successful and of general interest to the men engaged in the electrical industry in this district. Mr. Scott is a graduate of Lehigh University. After holding the position of efficiency engineer of the People's Gas, Light and Coke Company of Chicago, he came West and entered the employ of the U. S. Smelting Company of Salt Lake City, as assistant chief electrician. He later was in the employ of the Utah Light and Railway Company and the Bell Telephone Company, both of Salt Lake City. In 1911 he entered the employ of the Portland Railway, Light and Power Company, and after doing engineering and construction work in connection with the River Mill hydroelectric development of that company, transferred to the commercial department where he has held successively the positions of industrial power engineer, commercial office manager and commercial engineer.

J. D. SCOTT

Hilmar Pabst, general manager, and **E. L. Hall,** general superintendent, of the Portland Gas and Coke Company, are recent San Francisco visitors.

Obituary

John H. Felthousen, chief engineer of the S. Morgan Smith Company of York, Pa., died recently at his home in New York. Mr. Felthousen has been associated with the Morgan company for many years and has been closely identified with the activities which have marked the advancement of modern power equipment. His loss will be felt by a host of friends and associates in the hydraulic industry, in which he has been one of the leading figures.

George E. Henderson, electrical engineer connected with the San Francisco district office of the National Carbon Company, and electric furnace specialist, died recently. Mr. Henderson was a veteran of the Royal British Engineers. His loss will be felt by the electrical industry of the entire West.

Business Outlook in Western Market Centers

Reflecting the Trend of Community Thought on Conditions and Events Affecting Business and Industrial Activities Throughout the West

Compiled and edited for the Journal of Electricity and Western Industry by correspondents in all principal Western cities.

SAN FRANCISCO

Low temperatures caused snows in the high altitudes to pack firmly, and an abundant water supply for irrigation purposes and hydroelectric plants is now definitely assured through the summer months. The pack at Summit in the Sierra Nevada Mountains is reported to be 156 inches, as compared with a pack of 100 inches at this time a year ago. The month as a whole was not favorable for farming activities, and very little seeding has been accomplished; however, the continued rainfall has been extremely beneficial to crops already planted, and with the beginning of spring weather, growth should be rapid. Continued favorable reports from trade centers in this district tend to confirm predictions of steadily improving business conditions. There is still some tendency to keep prices up because of higher original costs on merchandise that has not moved, but there has been a general mark-down to at least absorb most of the profits of last year, and large handlers, realizing the futility of evading the facts, have taken their losses and figures down to present cost basis. Better demand for nearly all classes of merchandise is stabilizing prices on a new basis. Building operations continue brisk, particularly in cities and manufacturing towns. Declines in hardware, plumbing goods, electrical equipment and other building materials have helped to make a market and to stimulate buying of materials for remodeling stores and homes along with the large amount of new construction.

Some eastern producers are establishing representation here, and the general disposition is to go after business.

Stocks of dried and canned fruits are considerably lower than one year ago, and crop conditions are favorable, although the cool weather has retarded the season. Late spring rains have done much to encourage the grower of grain and forage crops, and livestock men in the interior are looking for a good year after a rather hard winter.

Banks report discount rates lower money plentiful, but considerable care is used in granting new unsecured credits. On the exchanges and with bond houses investment buying continues.

SEATTLE

In Seattle at the present time, according to a conservative estimate, there is more than $3,000,000 worth of building construction under way. These buildings include 300 new homes, 36 store and office buildings, 24 warehouses, three churches and four apartment houses. In addition to this construction for which permits have already been issued, buildings estimated to involve the expenditure of several more millions of dollars are projected.

The city of Seattle has at present more than $1,000,000 worth of improvement work under way in the city proper, in addition to the $2,000,000 Skagit River tunnel project, and other work on this big hydroelectric project, and the city engineering department reports at least $2,000,000 more will be spent on city improvement work during the season. In addition to the above expenditure, the Seattle Board of Public Works will shortly call for bids for the installation of a 17-mile $2,000,000 pipe line for the Water Department, this line extending from Molasses Creek to the Volunteer Park reservoir in the city.

King county has already contracted for $300,000 worth of highway construction and will award road contracts, aggregating another $500,000 worth of road construction before summer.

The unemployment situation in Seattle is daily improving and when all of the above projects are actually under way, it is expected all of the slack will be taken up in the local situation.

Retail and wholesale trade are holding their own, in spite of extremely inclement weather in the month of March. A slight improvement is noted in many lines, and there is a decided feeling that next month will show further betterment in all lines of business.

SPOKANE

Lumber mills throughout the Inland Empire are preparing to resume operations with large crews. With the exception of the Potlatch Lumber Company's mills at Potlatch and Elk River, Idaho, all of the big mills in northern Idaho and eastern Washington will reopen within the next 30 days.

The resumption of logging operations is contingent upon weather conditions. Many of the mills have logs imbedded in the ice of the rivers and lakes, while others must establish camps in the woods before tuning up their saws.

Work will be provided for hundreds of men as the mills reopen and labor will be provided for others in the woods when weather conditions will permit spring logging.

Considerable activity in mining districts is reported. Development work long held in abeyance because of unprofitable prices, is now going ahead.

Jobbing business continues to compare favorably with that of a year ago and buyers are more disposed to anticipate their future wants. There is a noticeable improvement in rural orders, due to better agricultural prospects. Retail business is of about the same volume as in the opening weeks of the year.

LOS ANGELES

January crude oil production averaged 313,472 barrels daily, making a decrease in total production for the month of 15,159 barrels, or 410 barrels daily. Stocks were increased by 1,239,-164 barrels, bringing the total storage up to 32,795,441 barrels on February 1.

Most of the estimates of the loss to citrus fruits from frost range from 55 to 70 per cent. The recent heavy rains have insured abundant feed, and in the cattle districts have saved the situation. Winter sown grains are making satisfactory progress, the acreage being somewhat larger than had been anticipated as to wheat and barley, and about the same as to oats.

Los Angeles building for January and February shows an increase of 143 per cent over the same months of 1921, the comparative figures being $15,572,-828, and $6,433,384. Bank clearings for the two months show an increase of over $78,000,000. Lumber receipts of Southern California in 1921 were 780,-501,487 feet.

Retail trade, as reflected in reports to the Federal Reserve Board from 33 department stores in the Twelfth District, continue to show an increase in the volume of trade. Ten wholesale lines report an increase in volume of sales in January as compared with those of January, 1921.

SALT LAKE CITY

It appears that the rather severe winter which has been experienced in the intermountain section is at an end, and with the advent of spring better business conditions are expected.

Several good-sized irrigation projects will probably be launched in the near future, and this, in addition to the extensive road building work in various localities, which is expected to materialize this coming spring and summer, will undoubtedly relieve the unemployment situation to a considerable extent.

About 30 men were recently added to the payroll at Bingham, and modified operations are expected. Mining operations along other lines, however, are quite extensive, and many of the old reliable mining camps are keeping their production almost up to normal.

Some encouragement is seen for the farmers and livestock raisers in the increase in prices of their products. Electrical contractor-dealers, while they have experienced some rather quiet times, are looking forward to renewed activity in the very near future as a result of extensive building operations which will undoubtedly begin with the spring weather. Retailers in general

report business as rather quiet, due to the unfavorable weather conditions, which have existed until recently. Collections are reported as fair.

There is a general feeling in this section that a business revival is not far off, and there are many indications that the coming spring and summer will show considerable improvement.

PORTLAND

If the building situation is an accepted barometer of economic conditions, Portland is rapidly recovering from the slack condition of the past year. Construction on new office buildings and a hotel is about to begin, the cost of which will run well over a million dollars. The lumber situation remains about the same, production running from 10 to 15 per cent below normal from week to week. Lumbermen are confronted with a log shortage due to the closing down of logging camps on account of bad weather conditions. The demand for wheat continues active and three full cargoes have been sold for early shipment. Electrical jobbers report conditions as continuing quiet although there is apparently no feeling of apprehension about the future. Country business is very spotty. Demands for radio equipment continue unprecedented. Contractor-dealer business is also somewhat spotty, some reporting conditions very good. Residence wiring is very active and many larger jobs are being taken, but competition is so keen that the profits are small. Electric ranges are selling more rapidly than any other line of appliances.

DENVER

Spring weather increased building activities, better collections, and plans for extensive development indicate that business has taken a marked turn for the better. The unemployment problem is still a serious one, however.

Actual buying is again being done in uncertain quantities. Some jobbers report small movements while others show increased demands for seasonable merchandise. Several of the largest electrical jobbers are making plans for considerable new business to be developed this spring and are adding to their organizations.

Business "dopesters" forecast a complete revival by May but it is generally believed that conditions will not become stabilized until after the fall harvest. Developments during the past fortnight are sufficiently encouraging, though, to give a tone of optimism to nearly all Rocky Mountain industries.

The new bank statement shows deposits in Denver banks of more than $145,000,000, a slight increase over the December statement, and an increase also over the February 21 statement last year. The ratio of cash and exchange to deposits is 37.8 per cent, a new high point. Rediscounts are approximately $1,000,000, showing a reduction of 30 per cent and marking a low level for this item. Cash and exchange have increased $12,000,000 since December 31—about 28 per cent.

Conditions in Twelfth Federal Reserve District

Current Summary Shows Easier Credit Conditions in Agricultural Districts Indicating Increased Purchasing Power For Farmers From Price Revisions

The monthly report on business and agricultural conditions issued by John Perrin, chairman of the board and Federal Reserve Agent of the Federal Reserve Bank of San Francisco, indicates several tendencies of the past month which will have a salutary effect on business in general. The Twelfth Federal Reserve District includes the states of California, Washington, Oregon, Idaho, Utah, Nevada and Arizona. A summary of the report follows:

Easier credit conditions in agricultural sections have been the immediate results of advancing prices for the principal **agricultural products** of the district, including cattle, sheep, hogs, the grains, the fruits, wool and sugar. During the four weeks ending March 8th, normally a period of some credit expansion in this district, country members reduced their borrowings from this bank by approximately $3,000,000 or 8.2 per cent. In the same period the prevailing interest rate charged borrowers in Salt Lake City, the financial center of the intermountain district, declined from 8 to 7 per cent and in Spokane, the center of another great agricultural section, from 7 to 6½ per cent. Advances during the past two months in the **prices** of farmers' products, accompanied as they have been by stability or a moderate decline in the price of most other groups of commodities, have effected a more nearly normal relation between the prices of things the farmer sells and the price of the things he must buy than has prevailed for the past year and a half. Such an adjustment has long been considered essential to any marked improvement of the general business situation.

Carryover Stocks

In contrast with conditions prevailing a year ago, **carryover stocks** of agricultural products are at present normal or below normal. The March 1st report of the United States Department of Agriculture showed that stocks of wheat on the farms of the principal wheat growing states of the district amounted to but 10 per cent of the former season's crop. Last year on the same date approximately 16 per cent of the 1920 crop was still held by the producers. Stocks of barley in California have been similarly reduced from the exceptionally high levels of 1921 and holdings of wool and of canned and dried fruit are less than the amounts customarily on hand at this season.

Lumber and Mining

Productive activity in this district was well sustained during the short month of February. In the **lumber industry**, production, shipments, and orders received were greater than in January, 1922, or February, 1921. The mills operated at approximately 85 per cent of normal capacity compared with 50 per cent a year ago. The resumption of inquiries for lumber from the agricultural states of the middle west was a particularly hopeful sign, especially for the inland mills which have not shared in the thriving water trade with the Atlantic Coast and Japan. Continued slow improvement was noticeable in the **mining industry**, effected more by lowered costs of production than by appreciation in mineral prices. Work is proceeding slowly at the five large copper mines of the district which in January announced that operations would be resumed. No ore has yet been mined by them. Figures now available on the January sales of **electric power** provide further evidence of increased industrial activity. Total industrial sales were 8 per cent greater in the Pacific Northwest and slightly greater in California than in January, 1921, the latter increase occurring despite a marked reduction in consumption for agricultural purposes. Similar improvement in the intermountain states is not yet discernible.

Increased productive activity and the resumption of seasonal outdoor work in some sections have combined to relieve the **unemployment** situation and more men were employed in February than in January. The peak of unemployment appears to have been passed.

Retail Trade

Notwithstanding accumulating evidence of better business in the future, buyers both at retail and at wholesale are proceeding cautionsly. **Retail sales** as reported by 33 department stores and mail order houses compared less favorably in February with those of the previous year than did January sales. The dollar value of sales in February was 8.7 per cent less than a year ago compared with a decline of but 6.3 per cent from January, 1921, to January, 1922. **Sales at wholesale**, reported by 185 firms in 10 lines of business, did not continue the improvement noted in each month since October, 1921. Comparison of sales in January and February of this year with sales in the corresponding months last year shows that in seven of the ten lines, there was an increase, during February, in the percentage of decline in value of sales as compared with January. In five of the ten lines the decline in the value of sales was greater than the average decline of wholesale prices during the past year, indicating a decrease in the physical volume as well as in the value of sales.

Building Activity

Building continues more active than a year ago. The number of permits issued in 20 principal cities in February, 1922, exceeded the number issued in February, 1921, by 14.0 per cent and the value of the 1922 permits exceeded the value of the 1921 permits by 60.5 per cent. Substantial improvement in the physical **volume of business** being transacted throughout the district is indicated by figures on debits to individual accounts in 20 clearing house centers. In the four weeks ending March 1, 1922, debits to individual accounts were only 3 per cent less than in the same period in 1921. In January, 1922, the decline compared with the previous year was 8.2 per cent.

The B-G Electric Shop and the **Utah Electric and Motor Equipment Company**, both of Salt Lake City, have consolidated under the firm name of the B-G Electric Shop, Inc., and will be located at 37 East First South Street. The new company will be under the management of Blaine Grey, former manager of the B-G Shop. The present store will be entirely remodeled and a complete line of electrical equipment and appliances installed.

W. Wesley Hicks has announced that the **Wesix Electric Heater** factory has moved to new and larger quarters at 115 Minna street, San Francisco. The offices of the company have been moved to the same location.

M. Zimmerman of the A and R Lamp Company of Newark, N. J., manufacturers of gas and electric portables, recently visited San Francisco. Mr. Zimmerman also represents the Radiant Lighting Fixture Company of New York.

The Electric Specialty Company of San Francisco will move into new and larger quarters at 75 Fremont street shortly after April 1.

Schweitzer and Conrad, Inc., Chicago, has perfected a new high voltage detector which is described in bulletin No. 105-A. Safety, simplicity and compactness are some of the features claimed for the device.

The Harvey Electric Company of Chicago has been formed through the merger of the Empire Transformer Company, with the Marquette Electric Company and the American Forge and Manufacturing Company.

H. H. Luedinghaus, sales manager of the St. Louis Malleable Casting Company is touring the Pacific Coast for the purpose of selecting distributing agents for the company's line of pole line hardware. **Charles R. Kierulff**, 757 Los Angeles St., Los Angeles, has been chosen representative for the company's products in Southern California.

Alex E. Krug, sales manager of the St. Louis Screw Company, is touring the Pacific Coast in the interests of his firm.

C. T. Riggs has opened a new electrical appliance shop at Independence, Oregon.

Walter Marshall and **Robert Anderson** have opened a contractor-dealer shop at Tacoma, Washington.

The Western Electric Company has been absolved of all charges of unfair competition by the Federal Trade Commission. The commission ordered the dismissal of the charges brought in January, 1921, after its attorneys had made a thorough investigation of the case and failed to find any facts to substantiate the original charges.

The Edison Electric Appliance Company, Chicago, manufacturers of Hotpoint appliances, announces the perfection of a new Hotpoint waffle iron. The new appliance is 8½ inches in diameter and is finished in polished aluminum and nickel plate. It embodies several new ideas in design and is made to sell at a popular price.

The Russell Electric Company, Chicago, manufacturers of "Hold Heet" electrical appliances, has placed on the market a new grill and a new sectional hot plate. The grill weighs one pound and is small and compact. The hot plate has three independent heating units giving seven heat combinations.

Manufacturer, Dealer, and Jobber Activities

The Cutler-Hammer Manufacturing Company, Milwaukee, has issued publication No. 2056 describing the new C-H appliance cord. The booklet is prepared for the use of dealers and space is provided for imprints.

The Union Electric Manufacturing Company, Milwaukee, has perfected a new type 30-ampere, 3-pole, 220-volt safety motor starting switch. The switch is provided with or without no-voltage release.

The Binks Spray Equipment Company, Chicago, has prepared bulletin No. 4-C describing the Binks spray tower, a water cooling device designed for small ice machines, oil engines and water cooled transformers, requiring the cooling of small quantities of circulating water. The towers are furnished in capacities ranging from 10 to 60 gallons per minute.

P. W. McCauley, western representative of the Russell Electric Company, with headquarters in Chicago, is a recent San Francisco and Los Angeles visitor.

The F. W. Wakefield Brass Company of Vermilion, Ohio, has added a general purpose hanger to their line of "Red Spot" hangers for commercial lighting units. They state that their aim in offering this general purpose hanger is to provide the trade with the cheapest good suspension that can be made.

William P. Swartz, formerly with the A. T. Knowlson Company of Detroit, has opened an electrical jobbing business at 754-760 North Spring Street, Los Angeles, under the firm name of the Commercial Associates. The new company will represent the Standard Electric Company, Sunnysuds and Aerobell electric washers, and Ohio-Tuec and Regina vacuum cleaners. An exhibit will be maintained in the Furniture Exchange Building, San Francisco.

The Arrow Electric Company, Hartford, Conn., is sending to jobbers who handle its lines copies of all advertisements run by the company to be used in place of ordinary "stuffers." The imprints carry the name of the jobber in a prominent place.

The Crooks-Nathan Household Appliance Company, of Denver, has been secured by Norman Ives to represent the Hamilton-Beach Company in that city in the sale of its new type vacuum cleaner.

The Mountain States Machinery Company of Denver has taken on the G and W Specialty Company line of potheads and disconnecting switches.

The Lovejoy Automatic Door Opener Company of Laramie, Wyo., has moved into its new factory, increased space having been necessitated through the increase in business of that company.

I. K. Browning has opened an electrical store at Burlington, Colorado, and intends to specialize in radio apparatus.

A contest for central station employes and electrical dealers has been launched by the **Mine and Smelter Supply Company** of Denver for the best statement of features and advantages found in the Westinghouse Type "M" iron.

One of Denver's largest jobbers, the **Hendrie and Bolthoff Company**, has been appointed Rocky Mountain distributor of the Radio Corporation of America.

The Mine and Smelter Supply Company, Denver jobbers, has introduced the new Sunshine vacuum cleaner in the Intermountain territory. The cleaner is manufactured by the Wise-McClung Company for Westinghouse distributors, it is understood.

The Whitaker Ranch Light Company of Denver, one of the oldest dealers of portable outfits in that city, is now specializing in the sale of Western Electric farm plants.

The Electric Supply and Construction Company, electragists and fixture makers of Denver, has perfected an electric cigar lighter which will shortly be placed on the market.

THIS IS NOT THE THIRD ARBUCKLE JURY

Even though this convivial crowd hails from Los Angeles, they have no connection with Hollywood or the motion picture colony. The main thing they put in motion is the Los Angeles Electric Club for they are the moving spirits of this organization. Most of them are officers of the club. The back row depicts, from left to right, W. A. Knost, the executive-secretary of the Electric Club; H. W. Allen, sales manager, Graham-Reynolds Co.; J. G. Pomeroy, manufacturers' agent. The front row presents some equally auspicious figures. They are D. W. Pontius, general manager, Pacific Electric Railway Company; E. R. Northmore, electrical engineer, Los Angeles Gas and Electric Company; Harry L. Harper, retiring president of the club, district manager, Western Electric Company; K. E. Van Kuran, newly elected president of the club, district manager, Westinghouse Electric and Manufacturing Company; Frank Van Vranken, general manager, Los Angeles Railway Company; J. E. MacDonald, secretary, Joint Pole Committee; B. G. Wright, commercial manager, Southern California Telephone Company, and H. B. Woodill of the Woodill-Hulse Company.

Construction News and Industrial Developments

Suggesting to the Engineer, Contractor, Manufacturer, Dealer, Agent and All Business Men Opportunities for New Business

THE PACIFIC NORTHWEST

BAKER, ORE.—Plans for a $50,000 plant at Chico and H Streets are being made by the Union Oil Company of California.

WENATCHEE, WASH.—Chelan county will spend a total of $330,000 on roads this season, according to announcement by County Commissioner Cadman.

WALLA WALLA, WASH. — Bids will be called for the construction of the bridge across the Snake River at Central Ferry near Dayton in September. The estimated cost is $300,000.

KLAMATH FALLS, ORE.—Parker & Banfield, of Portland, have been awarded a contract for the construction of a two-story brick theater and office building for Hart Bros. of this city.

MONROE, WASH.—At a recent election by a vote of 8 to 1, $84,000 bonds were authorized for making Lake Cochran available as a water supply for the town. Erection of a filtration plant is also contemplated.

EVERETT, WASH.—Bruce & Company of Seattle have been awarded the contract by the Great Northern Railway for construction of a 200-ft. steel span across the Miller River. The contract price is said to be $200,000.

SEATTLE, WASH.—The J. A. McEachern Co. of Seattle was awarded the contract at $300,000 to construct a sea wall. A contract for pier extension work, at a cost of $700,000, was awarded to Henry & McPhee, of Seattle.

SALEM, ORE.—Construction of the plant of the Capital Ice and Cold Storage Co., at an estimated cost of $75,000, has started. F. L. Leonard of Portland has the contract for the construction of the building and installation of machinery.

SEATTLE, WASH.—Pratt & Watson, contractors of Olympia and Tacoma, have been awarded the contract for construction of the foundation and first floor walls of the new state capitol main building on their bid of $397,514. Work will be started immediately.

SPOKANE, WASH.—A contract to sink 200 ft. to a new low level in the Morning Mine in the Coeur d'Alenes has been let by the Federal Mining & Smelting Company, owners of the property. This will give a depth of 2250 ft. in the main working tunnel, and will reach a depth of approximately 1700 ft. above sea level.

BELLINGHAM, WASH.—The Highland Dairy Co. will start the construction of a modern brick and tile structure at Mount Vernon to meet its present dairy needs and to provide for the installation of an ice cream manufacturing plant. A modern refrigerating system will be included.

SEATTLE, WASH.—Bids for the proposed Garfield High School building were ordered called for by the school board on two plans, the first plan submitted by the architect being for a completed building, estimated cost $725,000, and the other for an uncompleted building to cost approximately $600,000.

SEATTLE, WASH.—The Alaska Engineering Commission has completed plans for a single track structural steel bridge to be erected at Nenana on the line of the government railroad. The bridge will have a main span of 700 ft. and will require 2883 tons of steel. Bids will close at 11 a.m. on May 1 at the commission's office, 422 Bell Street Terminal, Seattle.

PORTLAND, ORE.—Permits for appropriation of water from Big Sheep creek and tributaries have been granted to the Mountain Sheep Irrigation District for irrigation purposes. A dam and canal 13 miles long, now under construction, are estimated to cost $125,000.

SPOKANE, WASH. — The Great Northern Railroad is contemplating an improvement program for the Hillyard terminals here calling for the expenditure of approximately $500,000 in the next three to five years. The plans include new shops about twice the size of the present buildings, an iron foundry and a new railway station.

SEATTLE, WASH.—Work has started on the Spring Apartment Hotel, a 11-story and basement structure of reinforced concrete. The cost, equipped, is estimated at $750,000. John Graham is the architect; Hans Pederson is the general contractor and the operation of the building will be under the management of West & Wheeler. When completed, this hotel will be the third largest building in the city.

SEATTLE, WASH.—Plans for the big concrete and steel Skagit river power house are nearly completed in the offices of hydroelectric engineer C. F. Uhden, in the Alaska Bldg., and construction will begin about June 1. Plans call for a building 168 by 90 ft. in size and 112 ft. in height with three floors, walls solid metal sash. The machinery to be installed before the end of the year. Two huge generators with water wheels in addition to six transformers will be housed. Above the generators a crane way to accommodate a 150-ton electric traveling crane with a clear span of 45 ft. is to be erected.

SEATTLE, WASH. — The Board of Lewis County Commissioners will receive bids at Montesano until 2 p.m. April 7 for the contract to erect a 130-ft. steel bridge resting on concrete piers and spanning the north fork of the Newaukum river on the A. Mitchell road. In addition to the span proper, 180 ft. of pile trestle approach will be constructed. (Improvement No. 227.) Also (Improvement No. 228), for constructing an 80-ft. steel bridge, tubular piers and 165 ft. of pile trestle across the North Fork of the Newaukum river on the Newaukum river road. Bids will also be accepted on constructing both of the foregoing improvements under one contract.

THE PACIFIC CENTRAL DISTRICT

RICHMOND, CAL. — Additions are being to the plant of the Pacific Sanitary Mfg. Co. made to the plant of the Pacific Sanitary Mfg. Co. at 5th and Hensley Streets, at a cost of $60,000.

SAN FRANCISCO, CAL.—Stephen F. Whitman & Sons, Inc., of Philadelphia, a large manufacturing concern, has decided to open a branch factory here, under the management of E. Farm.

ATASCADERO, CAL.—The Gay Engineering Corporation has been awarded contract for the erection of a cold storage and precooling plant, to be in operation by July 1st. The contract was made by the Caladero Products Co. and E. G. Lewis, personally, but it is intended to form a separate corporation to take over and manage this business.

NAPA, CAL.—The Napa Union High School district has purchased a 40-acre tract from the Southern Pacific Company to be used as a site for the Union High School. Work will begin immediately on plans and specifications by Architect Weeks, of San Francisco.

SACRAMENTO, CAL.—The California Life Insurance Company will erect an office building at the southwest corner of Tenth and J Streets, to cost approximately $1,000,000. The building will be eight or ten stories high, of steel and concrete construction. Work will start by July first.

SACRAMENTO, CAL. — The Independent Laundry Company, recently incorporated for $150,000, is planning the establishment of a new laundry here, the plant and equipment to cost approximately $100,000. The directors of the company are J. F. Sterner, J. S. Blair, A. C. Kallstead, C. M. Jones and H. N. Mitchell.

SELMA, CAL.—Consolidated Irrigation District is planning to authorize a bond issue of $850,000 of which $775,000 will be expended for the purchase of the system of Consolidated Canal Company and $75,000 for additions and betterments. W. L. Huber, First National Bank Building, San Francisco, is engineer for the district.

SAN FRANCISCO, CAL.—One of the last remaining large vacant holdings on Market Street has been sold by the McCreery Estate Company to Arthur F. Rousseau. The property has frontages on Market, Eighth and Mission Streets. Mr. Rousseau intends starting improvements immediately. The property will be divided into smaller units, with a view to the erection of ten buildings of from four to six stories each and representing an investment of possibly $10,000,000. Plans have been completed for two of the projected buildings, which will be of brick and steel construction.

SAN FRANCISCO, CAL.—Until April 12, 3 p.m., bids will be received by the Board of Public Works for furnishing and delivering under Contract No. 79, Hetch Hetchy Water Supply Project: Water Wheels and Valves for Moccasin Creek Power Plant. Bids will be taken under Section A, Water Wheel Units: 2, 3 or 4 25,000-hp. double overhung impulse water wheel units, each to drive a 20,000-kva. electric generator. Under Section B: Valves 4, 6 or 8, 36-in. valves—2 for each water wheel unit. (A single contract may be awarded covering both the water wheel units and the 36-in. valves or a contract may be awarded for water wheel units and another for valves.)

SAN FRANCISCO, CAL.—Until April 12, 3 p.m., bids will be received by the Board of Public Works under Contract No. 180, Hetch Hetchy Water Supply Project, for furnishing and delivering electric generators and accessory equipment for the Moccasin Creek Power Plant: Two 20,000-kva. electric generators, each with a direct connected exciter, also with one independent motor generator exciter set. (Provision is made to increase number of electric units to 3 or 4 within a period of 6 months.) Each of the main electric generator units will be driven by two 12,500-hp. water wheels overhung on the generator shaft. The shaft, the extension for the exciter, and the bearings, will be furnished with water wheels, under a separate contract. Plans may be had from City Engineer M. M. O'Shaughnessy, 3rd floor, City Hall.

NAPA, CAL.—The Union Ice Co. has announced that an ice plant will be built here to cost approximately $500,000. The building will be a four-story, reinforced concrete structure.

YUBA CITY, CAL.—Grape growers of Yuba and Sutter counties will have the raisin packing plant they requested, according to announcement made by W. M. Giffen and F. A. Seymour, of the California Associated Raisin Co. The plant will be located here.

COLFAX, CAL.—B. C. Soule, owner of a large tract of timber on the Forest Hill divide, and L. D. Stephenson, engineer in charge of operations, were in this city recently seeking a 25-acre site in this locality for a piling ground, planing mill and box factory.

THE PACIFIC SOUTHWEST

BURBANK, CAL.—The Pear Growers' Assn. of Palmdale has decided to erect a $225,000 refrigerating plant in Palmdale.

LOS ANGELES, CAL.—The North American Polish Co., with head offices in Cleveland, Ohio, will erect a factory near Los Angeles in the near future.

LONG BEACH, CAL.—G. A. Zamboni, of the Bessele patents, is contemplating the erection of a $75,000 factory here for the manufacture of Bessele devices.

LONG BEACH, CAL.—The National Axle Co. will erect a $300,000 factory building near Long Beach when suitable location is found. The head offices are located at San Jose.

SAN PEDRO, CAL.—Work will start at once upon Regan Forge & Machinery Co.'s plant to be built at San Pedro. Austin Co. are the contractors. The building will be of steel and brick.

BANNING, CAL.—The King's Food Products Co., of Portland, will erect a $500,000 dehydrating plant at San Bernardino, according to announcement made by Percy Donaldson, of Banning.

SAN BERNARDINO, CAL.—The Southern California Ice Co. will erect a storage plant at 3rd and I Streets, of brick construction, three stories high, this being the first of the three units to be erected.

BREA, CAL.—The Brea Tool Works have been incorporated at $50,000 and will erect a factory building at Redwood and Olinda Blvd. W. J. Travers, J. F. Schweitzer, A. D. Yost and M. Burroughs are the incorporators.

RIVERSIDE, CAL.—The Ripley Power and Water Company has incorporated with a capital stock of $70,000. Directors are J. O. Phillips, A. Vilman, Frank Sabathe, Harris D. Hollenbeck and J. N. Hesley.

LONG BEACH, CAL.—An 11-story apartment building will be erected by F. C. Waterbury on a 100 by 200-ft. site on Ocean Avenue near Atlantic Avenue. The building and furnishings will cost $1,000,000 and will contain 140 suites, each with bath.

SAN DIEGO, CAL.—An ice cream and candy factory will be erected by Robert Blankenship and Richard T. Robinson, Jr., at 1141 Fifth Street. The building will be 2-story and the equipment includes refrigeration machinery. Total cost estimates at $75,000.

SANTA BARBARA, CAL.—The Puritan Ice Co. will erect a factory along the Southern Pacific right-of-way and has been incorporated at $150,000. The incorporators are L. R. Phillips, T. Paul Dalzell and Laurence R. Larrabee.

LOS ANGELES, CAL.—The federal government has granted authority for construction of a lighthouse and fog signal station at Point Vicente, near Santa Barbara channel. Bids will be called for soon by the Light House Service. Estimated cost of the structure is $80,000.

ALHAMBRA, CAL.—Carmel of St. Teresa Convent will construct an addition to the convent and school at an estimated cost of $200,000, exclusive of equipment and furnishings. The new building will adjoin the present group at Alhambra and Monterey Sts.

THE INTERMOUNTAIN DISTRICT

DENVER, COLO.—The Windsor Farm Dairy Company has completed plans for a $100,000 addition to its plant at 18th and Blake Sts.

GRAND JUNCTION, COLO. — The Rettig Packing and Market Company has secured a site on which to locate its new $100,000 packing house.

DENVER, COLO.—The Continental Rubber Products Company, of which E. A. Sidnell is president, is negotiating for a site on which to build a factory.

CONRAD, MONT.—A contract for the building of a flour mill has been let by George Yeager to F. D. Finkenbinder. Work will begin at an early date.

SANTA FE, N. M.—Ground is to be broken at once for a $150,000 hotel here to replace the De Vargas, recently destroyed by fire. It will be a 100-room building.

DENVER, COLO.—Contracts have been let by the University of Denver for the construction of the new school of commerce in a down-town location at a cost of $100,000.

GLENDIVE, MONT.—The Northern Pacific Railway will build a new depot here at a cost of over $200,000. Construction will start as soon as weather conditions permit.

DENVER, COLO.—Ground has been broken for a four-story building, costing $400,000, which when completed will house the L. R. Steel Co., an international chain store organization.

DENVER, COLO.—The name of Fourteenth Avenue will be changed and a decorative lighting system installed, if a movement headed by Anna Wolcott Vaile, wife of Representative Vaile, materializes.

COLORADO SPRINGS, COLO.—General offices and yards of the W. F. McCue Mercantile Company—a Seattle lumber concern—are to be located here shortly, Grant Hemenway of this city has announced.

LAFAYETTE, COLO.—The Colorado Accumulative Company, storage battery manufacturers, will locate a factory in this city in accordance with an agreement recently made with the local commercial association.

BATTLE MOUNTAIN, NEV.—Robert Paysee, of Portland, Ore., has been awarded the contract for building a high school here. The structure will be of brick, two stories in height, and will cost $75,000.

MINA, NEV.—The Candelaria Mines Co. will start construction on a new mill as soon as weather conditions permit. The building of an electric transmission line from Mina to Candelaria is to start shortly.

DENVER, COLO.—Secretary of the Treasury Mellon has authorized the construction of a half-million dollar federal reserve bank building at 18th and Curtis St. The work will be directed through the Kansas City bank.

ELKO, NEV.—The Elko-Lamoille Power Company has announced improvements to cost $50,000, which will include a new power house, equipped with 250-hp. engines and equipment sufficient to supply a town of 5,000 inhabitants.

GRAND JUNCTION, COLO.—The new Western Slope Concrete Products Company plant, just completed here, has been opened. It represents an investment of $85,000. Howard M. Jay is general manager and Fred McRae is local manager.

DEMING, N. M.—Manufacture of the North Automatic hay baler will be started here within a few days, according to C. S. Cleaver, president of the Mimbres Valley Land & Utilities Company. The factory is to employ between 1500 and 2000 persons.

LIMON, COLO.—A $15,000 flour mill with a capacity of 50 barrels a day is to be built here by the Equity Elevator Company.

GALLUP, N. M.—Plans have been made by the Santa Fe to spend $750,000 on improvements in this vicinity. A $150,000 addition is to be built to the Harvey Eating House and El Navajo Hotel. The main line is to be double-tracked between Gallup and Perea.

HAMILTON, MONT.—A resolution has been passed by the commissioners of the Bitter Root Irrigation District for the purpose of issuing bonds for constructing an irrigation system, including concrete foundations for the flukes. The bond issue will be $1,140,000.

SHOSHONE, WYO.—Good headway is being made in the construction of the Wyoming Chemical Products Company plant, northeast of here. Seventy per cent of the machinery is on the ground and more than one-fourth of the construction work has been finished.

DENVER, COLO.—The John Elsner Hotel Company, headed by William A. Sharpe, a Detroit manufacturer, and Rosalind Elsner, daughter of Dr. John Elsner, plans the early construction of a seven to twelve-story hotel at 14th and Curtis Street at an estimated cost of $500,000.

BOZEMAN, MONT.—The South Bench Irrigation District, consisting of between 19,000 and 20,000 acres of dry lands located south of Three Forks and Willow Creek, was created recently. The district expects to construct a dam, with canals and laterals. The cost will be about $900,000.

CHEYENNE, WYO.—Announcement has been made of arrangements by the Union Pacific to spend $2,000,000 in Cheyenne this year. Most of the expense will be for a subway at the passenger station while the remainder will be used to extend the freight depot and enlarge the freight yards.

DENVER, COLO.—Plans have been made by the congregations of the North and Emanuel Presbyterian churches for the erection of a church building at West 37th Avenue and Federal Boulevard. The new edifice will be known as the North Presbyterian church and will cost, when completed, approximately $75,000.

BRIGHAM CITY, UTAH.—Plans are being considered for the establishment of a molasses factory in Brigham City, the purpose of which is to refine the beet sugar stock molasses into a table article. The city now has a large sugar factory on the main line of the railroad, which makes the location here of the new factory an ideal one.

BRIGHAM CITY, UTAH.—At a recent special meeting of the city council, it was decided to install a new lighting system on North and South Main Street. One of the lights has been placed on South Main Street for demonstration purposes. It is the intention of the city council to have the new lighting system installed within the next thirty days.

CARSON, NEV.—Frank Murphy, vice-president of the Virginia and Truckee Railway, has announced that within the next few weeks changes will be made which will replace the steam plant at the shops with electric power. Tentative plans call for the installation of at least seven motors, two of which will be in the machine room. Other improvements will be given final consideration as soon as the electric system is installed.

SALT LAKE CITY, UTAH.—The city commission has voted to advertise for jurisdiction and call for bids for the installation of a residential lighting district on Yale avenue from McClelland street to Fifteenth East, a distance of four and a half blocks. Bids will be opened at 10 o'clock a.m. April 4th. Forty-two ornamental standards will be erected in the four and a half blocks if the proposed improvement meets with the favor of the property owners. Proposals will be asked on cast-iron, steel and concrete standards.